

installation
and
user guide

hp StorageWorks enterprise integrations for xp arrays

Edition October 2003



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Part Number: B9357-96061

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WARNING Identifies a hazard that can cause personal injury

Caution Identifies a hazard that can cause hardware or software damage

Note Identifies significant concepts or operating instructions

this font - used for all text to be typed verbatim: all commands, path names, file names, and directory names also, text displayed on the screen

<this font> - used for variables used in commands

this font - used for GUI menu options and screen controls

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Product Description

1

HP StorageWorks Enterprise Integrations enables the following tools to discover HP storage devices:

- BMC PATROL (version 3.4) for Windows NT4.0/2000, HP-UX 11.x, Solaris 8
- HP OpenView Network Node Manager for Windows NT 4.0/2000 (version B.6.10, B.6.20), HP-UX 11.x (version B.6.10, B.6.20), Solaris 8 (version 6.20)
- HP OpenView Vantage Point Operations (version A 6.00) for HP-UX 11.x, Solaris 8
- Computer Associates Unicenter TNG Version 2.2 for Windows NT 4.0, Version 2.4 for Windows 2000 and Version 3.00 for Windows 2000 server
- IBM Tivoli NetView (Version 6.0) for Solaris 6/7 and AIX 4.1.5-4.3.3

Using these tools, you can manage the following types of HP storage devices either connected directly to an IP network or managed by a host. This software product enables the above tools to handle traps from HP storage devices and to also open their management stations in a Web browser.

- | | | |
|--------------------|-----------------|-------------------|
| — Stand-alone tape | — NAS tape | — Optical device |
| — Tape array | — Internal disk | — Optical jukebox |
| — Tape library | — Disk array | — Virtual array |
| — Tape autoloader | — NAS disk | |

The icons shown on the next page are used in the tools' maps to represent the above types of discovered HP storage devices. The device icons shown on the HP OpenView Network Node Manager map do not contain the bars (which indicate device status) on the top and left-side of the icons.



Requirements

HP StorageWorks Enterprise Integrations is designed to operate with one of the tools listed on [page 7](#). One of these tools must be installed and operating for this product to operate.

HP storage devices connected directly to the IP network and hosts that manage HP storage devices must meet the following prerequisites:

- SNMP service installed and running.
- SNMP extension agent supporting the device info table for HP storage devices.
- SNMP extension agent supporting the SNMP V1 protocol format.
- Device management software installed and running.

Downloading the Integrations

The integrations must be downloaded to the host and installed from there. The following procedure is used for locating and downloading the Integrations.

- 1 Connect to the CV-XP management station.
- 2 Click on the Support tab.
- 3 In the Contents frame, click on Integrating HP StorageWorks Command View XP with other products.
- 4 Scroll down to section HP StorageWorks Enterprise Integrations (HP SEMI-1).
- 5 Click on the link Installation Page for Windows (NT, 2000), HP-UX, and Solaris platforms.
- 6 Locate the appropriate Integration module and download it to a temporary directory on the host.
- 7 Go the appropriate chapter in this guide for further instructions on installing the Integrations.

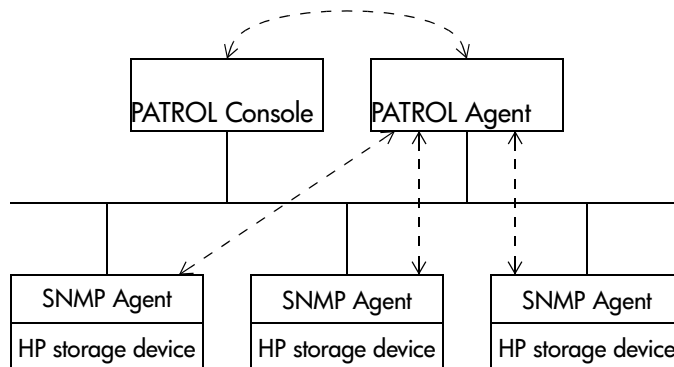
BMC PATROL Enterprise Integration

2

PATROL is a tool that lets you manage entities across a network. The entities you can manage with PATROL range from system memory to mainframe computers.

The BMC PATROL enterprise integration enables PATROL to manage HP storage devices either connected directly to an IP network or managed by a host. The integration enables PATROL to handle traps from HP storage devices and to also open their management stations in a Web browser.

PATROL consists of two major components: console and agent. The PATROL Console is in a centralized location and is accessed by the network administrator. The PATROL Agent is installed on either the same machine as the PATROL Console or a different machine. The PATROL Agent communicates (via the Net-citizen MIB II) with the SNMP agents running on the HP storage devices. The PATROL Console communicates with the PATROL Agent to obtain device information then displays that information in the console window.



Installing the BMC PATROL Enterprise Integration

Prerequisites on the PATROL Console machine:

- One of the following operating systems:
 - Windows 2000 /Windows NT 4.0 with service pack 4 or above
 - Solaris 8
 - HP-UX 11.0/11i/11.20
- PATROL Console version 3.4 (developer/operator).
- The PATROL Console and the PATROL Agents must be installed and started under the same user account.
- 128 MB RAM
- If applicable, HP Storage Security Certificate installed and configured for default Web browser. Note that security certificates are device specific; therefore, see the device's user's manual for information and installation instructions.

Prerequisites on the PATROL Agent machine:

- One of the following operating systems:
 - Windows 2000 /Windows NT 4.0 with service pack 4 or above
 - Solaris 8
 - HP-UX 11.0/11i/11.20
- PATROL Agent version 3.4.
- PATROL Agent should be running on the same platform as that of the Console
- Windows - The DLL files Kernal32.dll and ws2_32.dll must be in a directory listed in the system path.
- 128 MB RAM
- No other enterprise management software that handles traps should be installed. (These restrictions are the result of PATROL not providing any mechanism for filtering traps and handling only the appropriate traps.)
- Port in which the PATROL Agent receives SNMP traps cannot be bound to any other process. The default port is 162.

Installing on Windows

- 1 Log on as administrator to the machine running the PATROL Console.
- 2 Download the BMC Patrol Integration for Windows to a temporary directory. See ["Downloading the Integrations on page 10"](#).
- 3 Execute the setup file and follow the on-screen instructions to complete the installation.

Installation Failures

The HP Storage Device Management Knowledge Module for PATROL installation can fail for the following reasons:

- The PATROL Console software is not installed on the machine.
- The amount of hard disk memory available is insufficient.
- The target operating system is not supported.

Installing on HP-UX

- 1 Log on as administrator to the machine running the PATROL Console.
- 2 Download the BMC Patrol Integration for HP-UX to a temporary directory. See ["Downloading the Integrations on page 10"](#).
- 3 Start the installation by entering `swinstall` at a shell command prompt.
- 4 In the `swinstall` GUI, specify the following information:
 - Source Depot Type. Local directory.
 - Source Host Name. The name of the host where the depot file is located and will be installed.
 - Source Depot Path. The path to the temporary directory created in step 3. The path must include the name of the depot file. For example:
`/home/root/<temporary_directory>/StorageMgmt.depot`
- 5 If the source depot is not registered by default, you must register it. For example, enter the following command at a shell command prompt:
`swreg -l depot StorageMgmt.depot`
- 6 Mark `HPStorageMgmt` for installation, then confirm the installation from the Action menu item.
- 7 View the logfile to ensure a successful installation.

Installing on Solaris

- 1 Log on as administrator to the machine running the PATROL Console.
- 2 Download the BMC Patrol Integration for Solaris to a temporary directory. See ["Downloading the Integrations on page 10"](#).
- 3 Start the installation by executing the following:

```
cd <temp_directory>  
pkgadd -d HPStorageMgmt_BMC.pkg HPStorage
```
- 4 When prompted for a permission to run the scripts with super user permission, enter 'y'.
- 5 When the software installation is complete, select q to quit.

Post Installation Steps

The following actions need to be performed, after the installation, to start managing the SEMI Devices through BMC PATROL. The post installation steps are common for Windows, HP-UX and Solaris.

- Unix - The Web browser's Location has to be added to PATH environmental variable.
- Unix - Create PATROL_HOME environmental variable, initialized with the PATROL's Home directory (example: PATROL_HOME=/opt/PATROL3.4). The PATROL_HOME variable should be available for all the sessions opened so the user can create the variable in .profile for the account which is used inside BMC PATROL Console (as a Default account).
- Open the PATROL Console add the Host which has the PatrolAgent running. Make Sure the appropriate account is set for the host to be added.
- Establish connection between the PATROL Console and the PATROL Agent.
- The machine running PATROL Agent should contain PATROL_HOME environmental variable initialized with BMC PATROL's Home Directory. This variable is set by default for windows. But for HP-UX and Solaris the user has to create it. The PATROL_HOME variable should be available for all the sessions opened. So the user can create the variable in .profile for the account which is used inside BMC PATROL Console (as a Default account).
- Load the integration's knowledge modules by loading the KM list file HPSTORAGESEMI.kml. The file will be present in PATROL_HOME/lib/knowledge. The following three knowledge modules will be automatically loaded:

- HPSTORAGESEMI_Configuration.km
- HPSTORAGESEMI_Device.km
- HPSTORAGESEMI_Host.km

Commit the three knowledge modules to the host which is running the PATROL Agent

A storage device's global unique ID cannot contain a "/" or a space because the device is internally represented as /HPSTORAGESEMI_Device/GlobalUniqueID.

Using the BMC PATROL Enterprise Integration

Discovering HP Storage Devices

The discovery of HP storage devices happens every 24 hours.

The pop-up menu item Start Discovery in HPSTORAGESEMI_Configuration is used to manually start the discovery process. If you select Start Discovery when another discovery is in process, a dialog box asks you to confirm whether to proceed with the earlier discovery or stop it and start the new discovery.

The Discovery automatically stops when the 'Maximum devices allowed' limit is reached. This can be modified by selecting the pop-up menu item Maximum devices allowed.

Configuring the Host List

Select the pop-up menu item Configure the hosts in HPSTORAGESEMI_Configuration to configure the list of hosts to search during the discovery of HP storage devices. The user has the option of specifying either a list of IP addresses, a sub-net address, or all hosts. The text box corresponding to the selected radio-button is used and the data entered in other text boxes is ignored.

PATROL Map

Unique icons are used in the PATROL map to represent discovered HP storage devices. Icons representing host-managed devices are created in a separate submap under the icon representing the managing host. The device icon's label shows either the device's IP name (direct-connected) or global unique ID (host-managed).

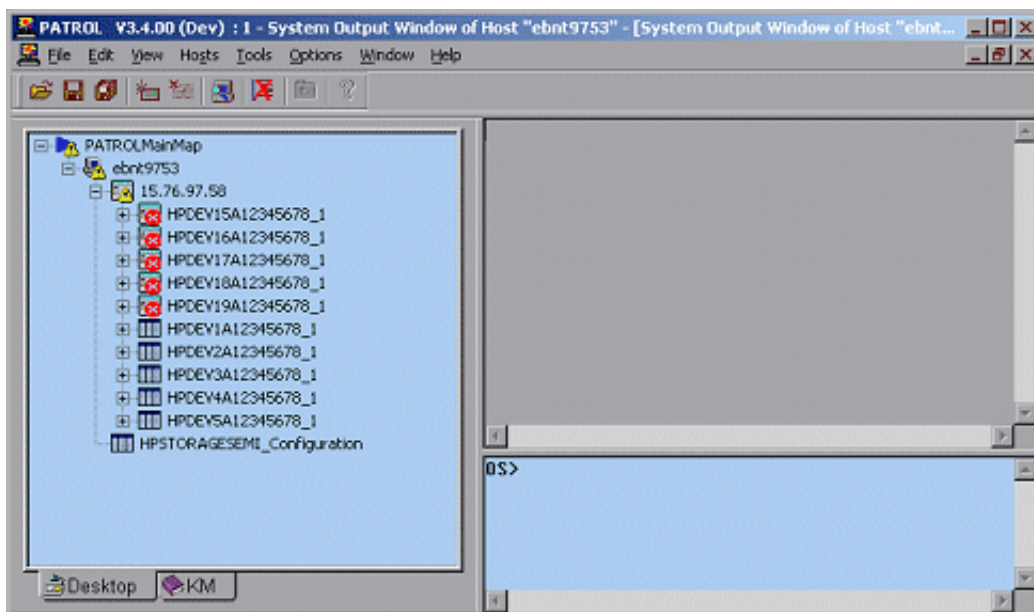
Windows NT/Windows 2000

The background color of a device's icon represents the status of the device. The background color of a host's icon changes to show device status. That is, device status is propagated to the managing host's icon. The color of the icon indicates the state of the device. The green color is used to indicate that the device is in a normal state ("OK" state). The red color is used when the device is in a "Not-OK" state, i.e. Warning, Unknown or Critical states. To differentiate among the "Not-OK" states, the device icon blinks when the

device is in Unknown or Critical states, and it does not blink if it is in Warning state.

Figure 1 shows that the PATROL Agent, which is running on host ebnt9753, has discovered 10 host-managed devices on host 15.76.97.58. The icon labeled HPStorageSEMI_Configuration contains menu items for configuring the host list and restricting the number of devices discovered.

Figure 1 PATROL Map - Windows.

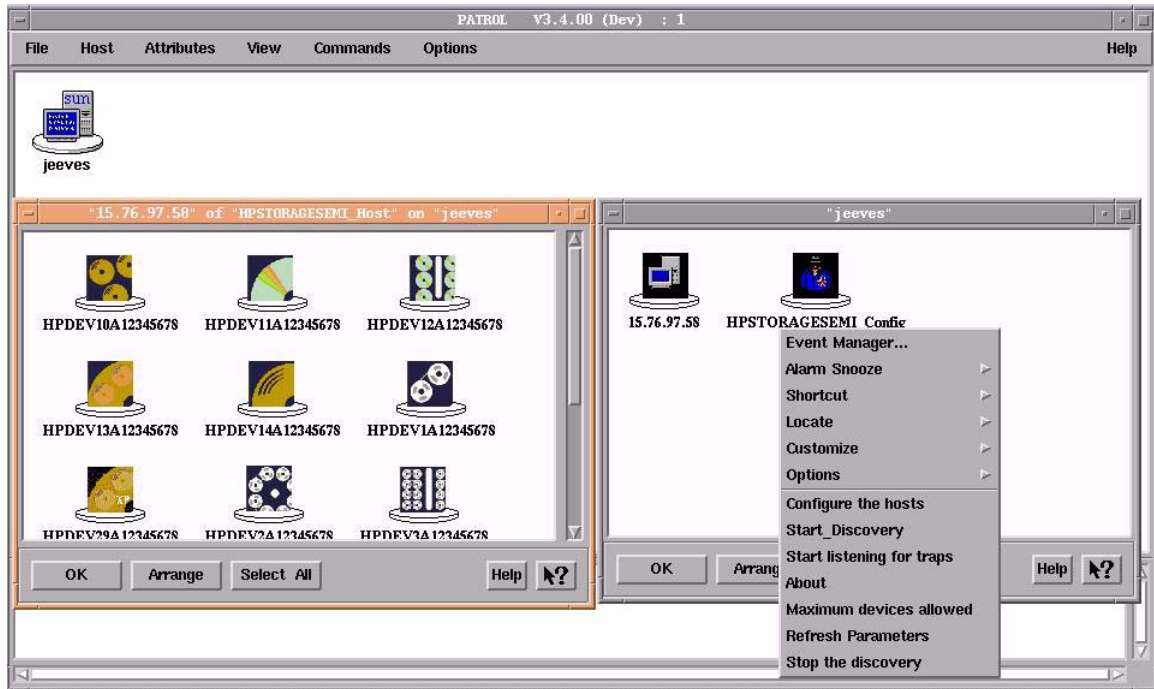


HPUX/Solaris

The platter of a device represents the status of the device. The background color of a host changes to show device status. That is, device status is propagated to the managing host. A white circular platter is used to indicate that the device is in a normal or OK state. A red platter is used to indicate that the device is in a Not-OK state, which includes Warning, Unknown, or Critical states. To differentiate among the Not-OK states, the device icon blinks when the device is in an Unknown or Critical state, and the icon does not blink if the device is in a Warning state. To find the actual state of the device, look in the device's info-box in the DeviceHealth entry.

Figure 2 shows that the PATROL Agent, which is running on host jeeves, has discovered 15 host-managed devices on host 15.76.97.58. The icon labeled HPStorageSEMI_Configuration contains menu items for configuring the host list and restricting the number of devices discovered.

Figure 2 PATROL Map - Unix



Viewing Device Information

Invoke the Info-box of the device to look at the details of the device. A sample Info-box is shown in Figure 3. Click Update in the Info-Box to have all the information displayed. The Device information is not automatically updated.

Figure 3 Info-box

Item	Value
State:	OK
Icon type:	Application
✓ KM version	2.00.0011
✓ Host name	15.76.96.162
✓ DeviceGlobalUniqueID	HPDEV10A12345678
✓ DeviceHealth	Device is in OK state
✓ DeviceSysObjID	1.3.6.1.4.1.11.10.2.1.10
✓ DeviceManagementURL	www.hp.com\cass_dev
✓ DeviceManagementURLLabel	Device-10-URL
✓ DeviceManufacturer	HP
✓ DeviceProductName	Device Type 10
✓ DeviceProductCaption	HPSurestore
✓ DeviceSerialNumber	123-456-789
✓ DeviceVersion	1.0
✓ DeviceHWVersion	2.0
✓ DeviceROMVersion	3.0
✓ DeviceAssetNumber	XZ234
✓ DeviceContactPerson	Bob Fish
✓ DeviceContactPhone	970-111-2222
✓ DeviceContactEmail	bob@fish.com
✓ DeviceContactPagerNumber	970-222-3333
✓ DeviceLocation	Raised Floor

Configuring Device Information

From within BMC PATROL, use the following steps to configure device information for a certain HP storage device:

- 1 Select the pop-up menu item Configuring Device Information. A dialog box similar to [Figure 4](#) will be displayed.
- 2 Change the values of the entries whose value needs to be changed. Ensure that all new values are correct because they are not validated by the system.

- 3 Click OK to save the changed values.

Note This feature is not supported on all HP storage products. Refer to the product documentation to determine if your product supports this feature.

Figure 4 Configuring Device Information.

Field	Value
URL of the Management station	www.hp.com\cass_dev
Asset Number of the device	XZ234
Contact person for the device	Bob Fish
Email id of the contact person	bob@fish.com
Pager No. of the contact person	970-222-3333
Location of the device	Raised Floor
Rack id of the device	D43
Rack position of the device	5
Contact person's phone number	970-111-2222

SNMP Traps

All traps from the HP storage devices are received by the management station (for example, PATROL). The integration takes the appropriate action based on the type of trap and the PDU contents. The types of traps received from HP storage devices are as follows:

- **State Change.** The device status (represented by the icon's background color) is changed to show the type of trap.
- **Add Device.** When this type of trap indicates the device is a host-managed device, an icon for both the host (if not already shown in the map) and device is created in the PATROL map. When the trap indicates the device is

connected directly to the IP network, an icon for only the device is created in the PATROL map.

- **Delete Device.** Redraws the PATROL map to show the exact number of devices and their current status.

An entry is added to the Event Manager table (see [Figure 5 on page 22](#)) each time the integration receives a recognizable trap. The integration ignores unrecognized traps and no entry is made in the Event Manager table. Use the following steps to open the Event Manager table and to view information about a trap:

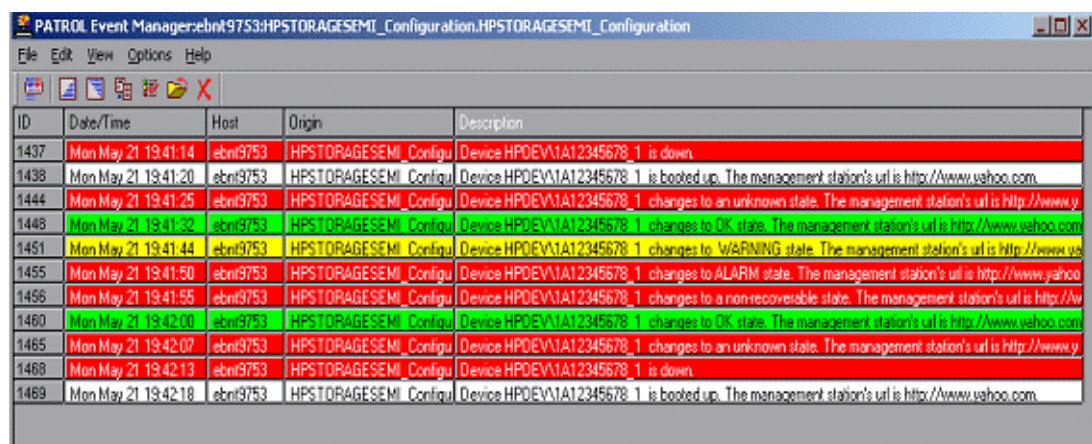
- 1 From the Console Window, right-click the icon HPSTORAGESEMI_Configuration.
- 2 From the pop-up menu, select Event Manager.
- 3 From the Event Management table, right-click the trap entry.
- 4 From the pop-up menu, select Details.

Launching the Device Management URL

From within PATROL, use the following steps to launch the device management URL:

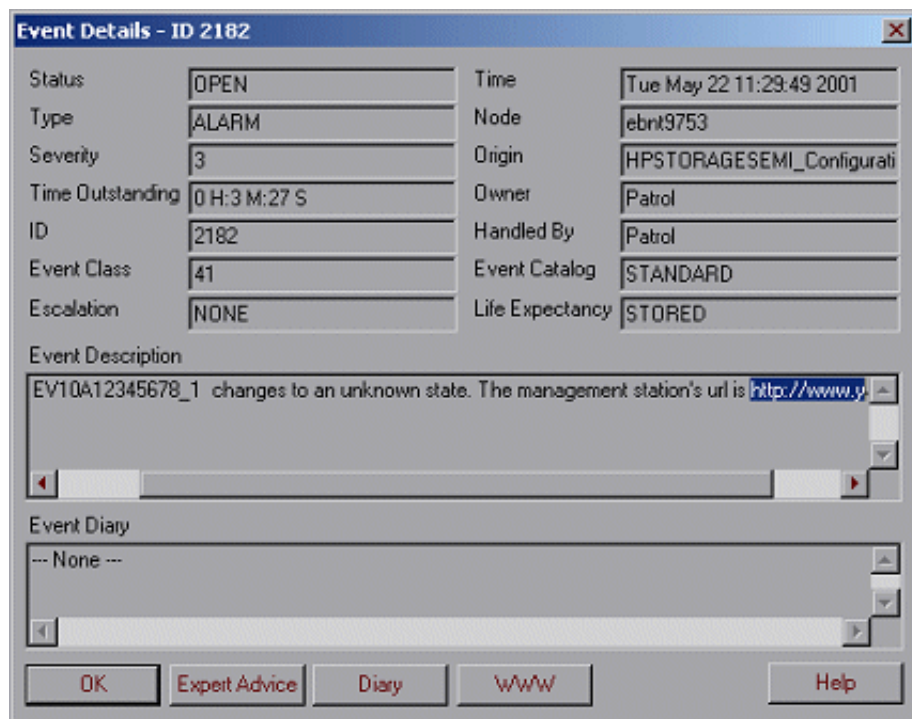
- 1 From the Console Window, right-click the icon HPSTORAGESEMI_Configuration.
- 2 From the pop-up menu, select Event Manager.
- 3 From the Event Management table, right-click a trap entry.
- 4 From the pop-up menu, select Details.
- 5 In the Event description select the management station's URL then click the WWW button. See [Figure 6](#).

Figure 5 Event Manager Table.



ID	Date/Time	Host	Origin	Description
1437	Mon May 21 19:41:14	ebnt9753	HPSTORAGESEMI_Config	Device HPDENV1A12345678_1 is down.
1438	Mon May 21 19:41:20	ebnt9753	HPSTORAGESEMI_Config	Device HPDENV1A12345678_1 is booted up. The management station's url is http://www.yahoo.com.
1444	Mon May 21 19:41:25	ebnt9753	HPSTORAGESEMI_Config	Device HPDENV1A12345678_1 changes to an unknown state. The management station's url is http://www.y
1448	Mon May 21 19:41:32	ebnt9753	HPSTORAGESEMI_Config	Device HPDENV1A12345678_1 changes to OK state. The management station's url is http://www.yahoo.com
1451	Mon May 21 19:41:44	ebnt9753	HPSTORAGESEMI_Config	Device HPDENV1A12345678_1 changes to WARNING state. The management station's url is http://www.us
1455	Mon May 21 19:41:50	ebnt9753	HPSTORAGESEMI_Config	Device HPDENV1A12345678_1 changes to ALARM state. The management station's url is http://www.yahoo
1456	Mon May 21 19:41:55	ebnt9753	HPSTORAGESEMI_Config	Device HPDENV1A12345678_1 changes to a non-recoverable state. The management station's url is http://w
1460	Mon May 21 19:42:00	ebnt9753	HPSTORAGESEMI_Config	Device HPDENV1A12345678_1 changes to OK state. The management station's url is http://www.yahoo.com
1465	Mon May 21 19:42:07	ebnt9753	HPSTORAGESEMI_Config	Device HPDENV1A12345678_1 changes to an unknown state. The management station's url is http://www.y
1468	Mon May 21 19:42:13	ebnt9753	HPSTORAGESEMI_Config	Device HPDENV1A12345678_1 is down.
1469	Mon May 21 19:42:18	ebnt9753	HPSTORAGESEMI_Config	Device HPDENV1A12345678_1 is booted up. The management station's url is http://www.yahoo.com.

Figure 6 Event Details.



Event Details - ID 2182

Status	OPEN	Time	Tue May 22 11:29:49 2001
Type	ALARM	Node	ebnt9753
Severity	3	Origin	HPSTORAGESEMI_Configurati
Time Outstanding	0 H:3 M:27 S	Owner	Patrol
ID	2182	Handled By	Patrol
Event Class	41	Event Catalog	STANDARD
Escalation	NONE	Life Expectancy	STORED

Event Description

EV10A12345678_1 changes to an unknown state. The management station's url is <http://www.y>

Event Diary

--- None ---

OK Expert Advice Diary WWW Help

Setting the Trap-Destination Address

A management station (for example, PATROL) must be able to receive traps from the device to manage it.

To receive traps, you will need to manually add the management station's address to the device's list of trap destinations. Refer to Appendix A for help on setting the trap destinations.

To identify whether or not the trap-destination address has been set, look at the field *Trap_Destination* in the host's info-box. This field's value is set to *"Need to set manually."*

Because there is no host icon associated with devices connected directly to the IP network, the field *Trap_Destination* is listed in the device's info-box. The menu item *Set_trap_destination* is provided with the device icon to set the trap-destination address.

For host-managed devices, the field *Trap_Destination* in the device's info-box is set to *"Refer to the host icon's Trap Destination info-box entry."* This is because the host icon would be trying to set the trap-destination address for the host-managed devices. Therefore, the device icons do not need to set the trap-destination address.

Note When a dialog box generates an error message, it should be closed before taking any corrective action.

Uninstalling the BMC PATROL Enterprise Integration

Uninstalling on Windows

To uninstall the BMC PATROL enterprise integration, use the Windows deinstallation program.

- 1 Navigate to the Windows Control Panel, and then double-click the Add/Remove Programs icon.
- 2 Select BMC PATROL Enterprise Integration from the list, and then click the Add/Remove button.
- 3 Follow the on-screen instructions to uninstall the BMC PATROL enterprise integration program files.

Uninstalling on HP-UX

- 1 From the HP-UX 11.x node containing the Storage Management enterprise integration for BMC PATROL, enter `swremove`. This starts the `swremove` GUI.
- 2 Select `HPStorageMgmt` for uninstallation.
- 3 Mark it, then confirm the uninstallation from the Action menu item.
- 4 View the logfile to ensure a successful uninstallation.

Uninstalling on Solaris

- 1 On the Solaris machine on which the Storage Management enterprise integration for BMC PATROL is installed, enter the following command:

```
pkgrm HPStorage
```

When prompted to confirm the removal of the integration, enter 'y'.
- 2 2 When prompted to begin the uninstallation with super user permission, enter 'y'.
- 3 3 The uninstall process will begin. When the process is complete, the following message will be displayed:

```
Removal of <HPStorage> was successful
```


Post Uninstallation Steps

The post uninstallation steps are common for Windows, HP-UX and Solaris. After uninstalling the integration files from the PATROL Console, some files must be manually removed from the PATROL Agent. The files that need to be removed manually are:

- The .KM files with prefix HPSTORAGESEMI_ in directory
 <patrol_home>\lib\knowledge
- The directory <patrol_home>\lib\HPSTORAGESEMI_config

Knowledge Module Descriptions

This section provides greater detail about the three knowledge modules included with the BMC PATROL integration.

Knowledge Module HPSTORAGESEMI_Configuration

This knowledge module contains the parameters and menu-items for doing device discovery and trap handling.

Parameters

- Discover_HPSTORAGESEMI_Devices - discovers the list of storage devices connected to the configured list of hosts. This is executed once a day. While executing, HPSTORAGESEMI_Configuration's info-box entry "Discovery" is set to "ON". When the discovery is completed, it is set to "OFF". For host-based devices, it creates an icon for the host under which the icons for the devices connected to that host are created. For direct-attached devices, the host icon is not created.
- TrapHandler - handles the traps received from the devices. This is executed every 5 seconds to process traps as quickly as possible. Based on the criticality of the traps, the state of the corresponding device is changed. Also, an entry is added to the Event Manager table for all valid traps.
- ExtraFilesList - responsible for committing the additional files used by the KM when the KM is committed. The files that are moved are `SetTrapDestination.exe` and the `.dll` files used by it.
- Create_Config_Directory - creates the directory `HPSTORAGESEMI_Config` which contains the configuration files. This is required because the installation of the integration creates this directory only in the PATROL Console. If the PATROL Agent is running on a different machine, this configuration directory has to be programmatically created.

Menu items

- Start Discovery - provides forced discovery of the devices. While the forced discovery is executing, HPSTORAGESEMI_Configuration's info-box entry "Discovery" is set to "ON". When the discovery is completed, it is set to "OFF". For host-based devices, it creates an icon for the host under which the devices connected to that host are created. For direct-attached devices, the host icon is not created.

- Refresh Parameters - refreshes the parameters associated with a HPSTORAGESEMI_Configuration instance.
- Stop Discovery - stops the discovery process if it is in progress. If the discovery is not in progress, this command exits.
- Maximum devices allowed - configures the maximum number of device managed. This is done to avoid discovering a large number of devices that might overload the patrol agent. During the discovery process, if the number of devices discovered reaches the maximum value, the discovery stops.
- Start listening for traps - enables the knowledge module to listen for traps.

Knowledge Module HPSTORAGESEMI_Host

For the host-based devices, an instance of HPSTORAGESEMI_Host is created under which the device instances are created. The HPSTORAGESEMI_Host instance is labeled with the IP address of the host which it represents.

Parameters

- Set_Trap_Destination - adds the management station address to the set of trap destination addresses so that new traps are sent to the management station. This is executed once an hour.

Menu-items

- Set Trap Destination - adds the management station's address to the set of trap destination addresses so that new traps are sent to the management station. Its functionality is similar to that of the parameter "Set_Trap_Destination", but is provided so that the user can set the destination address whenever necessary.
- Refresh Parameters - refreshes the parameters associated with the instance of the HPSTORAGE SEMI_Host application class.

Knowledge Module HPSTORAGESEMI_Device

Each instance of HPSTORAGESEMI_Device indicates an HP storage device. It contains the info-box items which give information about various attributes of the device such as the device type, status etc. It also has menu-items for setting device attributes.

Parameters

- **Set_Trap_Destination** - adds the management station's address to set of trap destination addresses so that whenever a new trap is created, it is sent to the management station. This is executed once an hour. If the device is a host-based device, this parameter returns without taking any action. This is because the trap-destination setting is taken care by the HPSTORAGESEMI_Host instance corresponding to the host to which the device is connected.

Menu-items

- **Set Trap Destination** - adds the management station's address to set of trap destination addresses so that whenever a new trap is created, it is sent to the management station. If the device is a host-based device, this menu-item returns without taking any action. This is because the trap-destination setting is taken care by the HPSTORAGESEMI_Host instance corresponding to the host to which the device is connected. This helps in improving the performance because it is possible to have a large number of devices connected to a host.
- **Refresh Parameters** - refreshes the parameters associated with the instance of the HPSTORAGE SEMI_Device application class.

HP OpenView NNM Enterprise Integration

3

HP OpenView Network Node Manager (NNM) is a network management product that provides integrated administration of all IT resources in an enterprise. These resources can include network devices (for example, routers and hubs), databases, business applications for desktop systems and mainframes, and all servers. OpenView includes components for event management, monitoring, and controlling network elements on both IP and IPX networks.

The HP OpenView NNM enterprise integration enables the NNM to manage HP storage devices either connected directly to an IP network or managed by a host. The integration enables the NNM to handle traps from HP storage devices and to also open their management stations in a Web browser.

Installing the HP OpenView NNM Enterprise Integration

Prerequisites on the HP OpenView NNM Station

- One of the following operating systems:
 - Windows 2000 or Windows NT 4.0 with Service Pack 5 or above
 - Solaris 8
 - HP-UX 11.0/11i/11.20
- 128 MB RAM
- SNMP Service installed and running.
- HP OpenView Network Node Manager version 6.10 or 6.20
- A web browser; either Microsoft Internet Explorer (version 5.0 or above) or Netscape.
- If applicable, HP Storage Security Certificate installed and configured.
Note that security certificates are device specific; therefore, see the device's user's manual for information and installation instructions.

Installing on Windows

- 1 Log on as administrator to the machine running the HP OpenView Network Node Manager (NNM).
- 2 Download the HP OpenView NNM Integration for Windows to a temporary directory. See ["Downloading the Integrations on page 10"](#).
- 3 Execute the setup file and follow the on-screen instructions to complete the installation.
- 4 Ensure that all HP OpenView NNM services have been started. If any of the services are not running, use the following command to start them:

```
ovstart -v
```
- 5 Close the NNM GUI if it is open.
- 6 Click the installation link for HP OpenView NNM for Windows, then follow the on-screen instructions to complete the installation.

Note Category number 7 is used for Storage Alarms in the NNM Alarm Browser.

Installing on HP-UX

- 1 Log on to an HP-UX 11.x machine with HP OpenView Network Node Manager (NNM) installed.
- 2 Download the HP OpenView NNM Integration for HP-UX to a temporary directory. See ["Downloading the Integrations on page 10"](#).
- 3 Ensure that all HP OpenView NNM services have been started. If any of the services are not running, use the following command to start them:

```
ovstart -v
```
- 4 Close the NNM GUI if it is open.
- 5 Start the installation by entering `swinstall` at a shell command prompt.
- 6 In the swinstall GUI, specify the following information:
 - Source Depot Type. Local directory.
 - Source Host Name. The name of the host where the depot file is located and to be installed.
 - Source Depot Path. The path to the temporary directory created in step 3. The path must include the name of the depot file. For example:

```
/home/root/<temporary_directory>/StorageMgmt.depot
```
- 7 If the source depot is not registered by default, you must register it. For example, enter the following command at a shell command prompt:

```
swreg -l depot StorageMgmt.depot
```
- 8 Mark HPStorageMgmt for installation, then confirm the installation from the Action menu item.
- 9 View the logfile to ensure a successful installation.
- 10 Open the HP OpenView NNM GUI. You might see the following error when opening the GUI:

```
Error: Unknown field "isStorageDevice"
```

This error should disappear after subsequent openings of the GUI. HP OpenView NNM is updating all of its data and registration repositories about the HP storage device during this initial installation.

Note Category number 7 is used for Storage Alarms in the NNM Alarm Browser.

Installing on Solaris

- 1 Log on to a Solaris machine with HP OpenView Network Node Manager (NNM) version 6.20 installed.
- 2 Download the HP OpenView NNM Integration for Solaris to a temporary directory. See "[Downloading the Integrations on page 10](#)".
- 3 Ensure that all HP OpenView NNM services have been started. If any of the services are not running, use the following command to start them:

```
ovstart -v
```
- 4 Close the NNM GUI if it is open.
- 5 Start the installation by executing the following command:

```
cd <temp_directory>  
pkgadd -d HPStorageMgmt_NNM.pkg HPStorage
```
- 6 When prompted for a permission to run the scripts with super user permission, enter 'y'.
- 7 When the software installation is complete, select 'q' to quit.
- 8 Open the HP OpenView NNM GUI to start managing the Storage Devices.

Note Category number 7 is used for Storage Alarms in the NNM Alarm Browser.

Using the HP OpenView NNM Enterprise Integration

Discovering HP Storage Devices

The HP OpenView Network Node Manager (NNM) discovers HP storage devices by querying the systems discovered by netmon for the existence of a device info table. The queried system returns a value for the table entry if it is a supported HP storage device either connected directly to the IP network or managed by a host.

Once the installation is complete, the HP OpenView NNM will not display icons for HP storage devices if it did not discover any of them. You can wait until the NNM default discovery process discovers the devices in the consecutive polling, or you can do a manual discovery by executing this sequence of commands on the node running the HP OpenView NNM:

```
loadhosts -c IP_address  
ovtopodump IP_address  
nmdemandpoll IP_address
```

IP_address is either the IP address of an HP storage device connected directly to the IP network or the IP address of a host that manages HP storage devices.

An HP storage device connected directly to the IP network is assumed to have RelationshipType set to *host* in its device info table. The mibII/system/sysobjID is the same as the device sysobjID in the device info table for that device. A host that manages HP storage devices is assumed to have RelationshipType set to *other* for all HP storage devices it manages.

NNM Map

Unique icons are used in the NNM map to represent discovered HP storage devices. Icons representing host-managed devices are created in a separate submap under the icon representing the managing host. The device icon's label shows either the device's IP name (direct-connected) or global unique ID (host-managed).

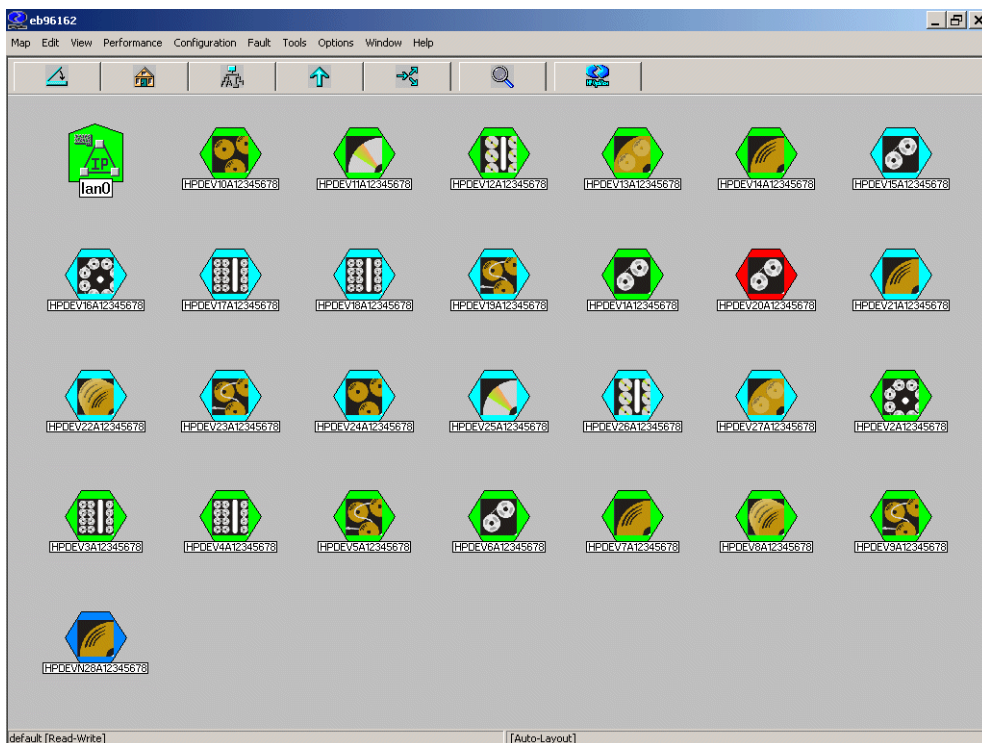
The background color of a device's icon represents the status of the device. The background color of a host's icon is set by the netmon process and does not

change to show device status. That is, device status is not propagated to the managing host's icon.

The current status of a device connected directly to the IP network might not be shown in the NNM map after certain events (for example, after a netmon discovery or when the HP OpenView NNM is first started). You must manually update the NNM map to obtain the device's current status.

You can manually update an NNM map showing previously discovered HP storage devices. To update the map, right-click an icon for either a direct-connected device or managing host, then select *Discover Storage* from the pop-up menu. You can also select an icon for either a direct-connected device or managing host, then select *Discover Storage* from the Tools pull-down menu.

Figure 7 HP OpenView Network Node Manager Map.



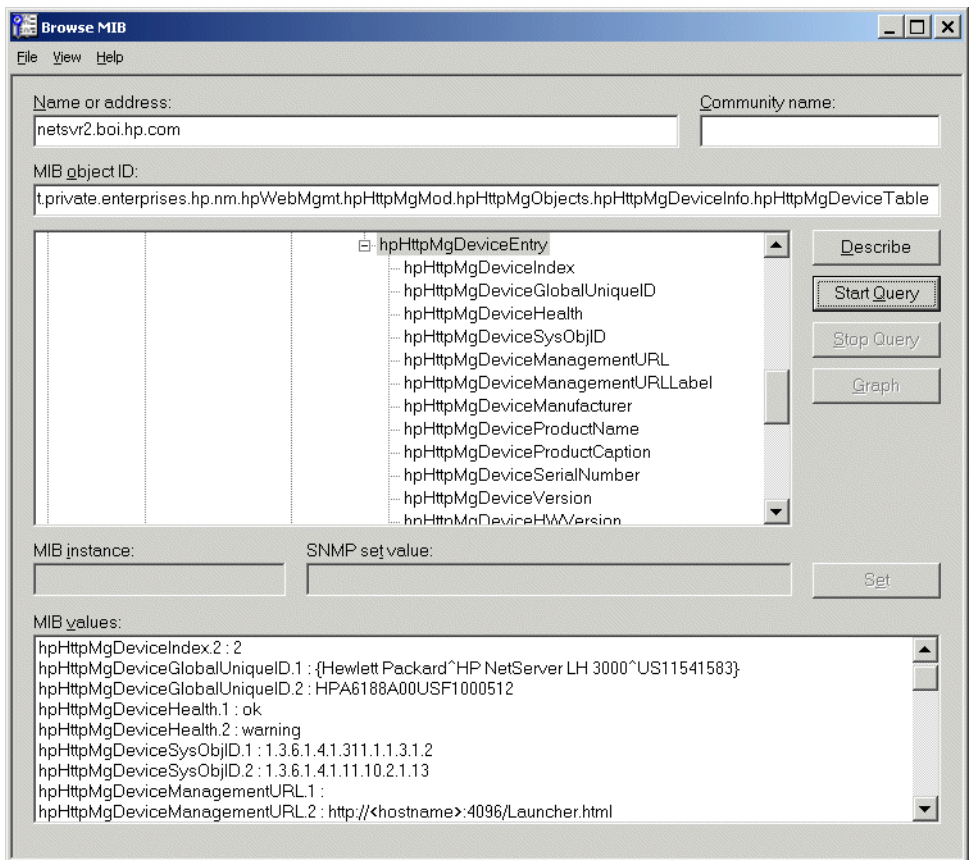
Viewing Device Information

From within HP OpenView NNM, use the following steps to view information about a certain HP storage device:

- 1 From the Tools pull-down menu, select SNMP MIB Browser.
- 2 In the Browse MIB window, type either the DNS name or IP address of a direct-connected device or managing host.
- 3 Select the entry `hpHttpMgDeviceTable`, then click Start Query. The device information is shown in the MIB values box.

Note The HP OpenView NNM enterprise integration cannot configure device information for HP storage devices that do not support SNMP set operations.

Figure 8 MIB Browser.

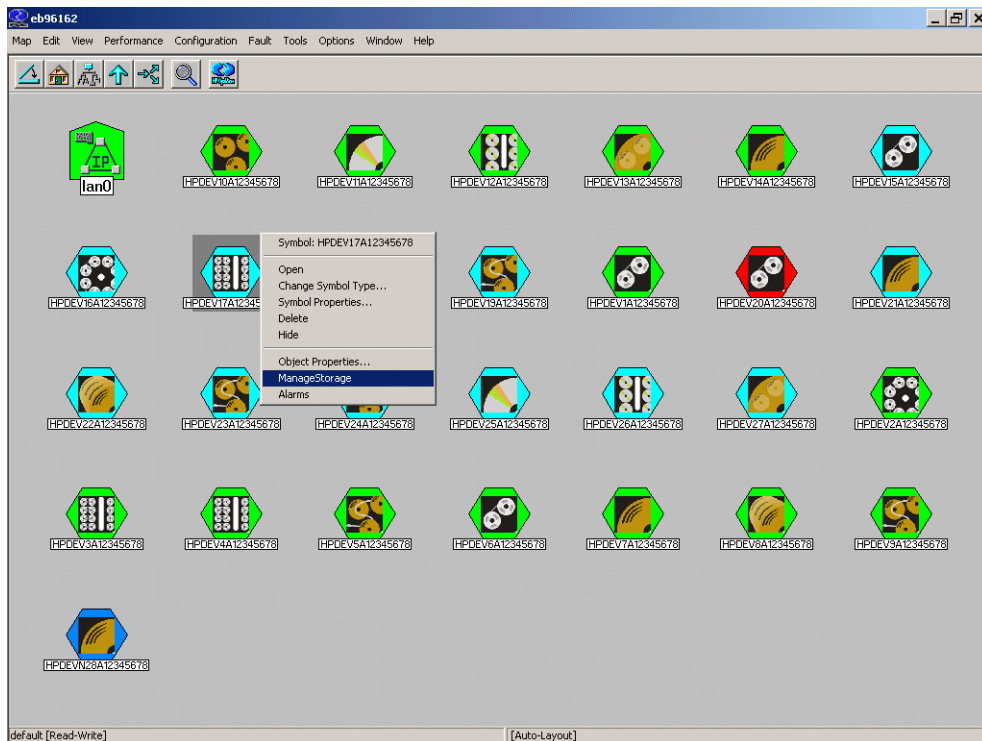


Launching the Device Management URL

From within HP OpenView NNM, use the following steps to launch the device management URL:

- 1 From the HP OpenView NNM GUI, double-click a host icon.
This displays icons for all of the HP storage devices connected to that host.
- 2 Right-click one of the device icons, then select Manage Storage from the popup menu. You can also select a device icon, then select Manage Storage from the Tools drop-down menu.

Figure 9 Launching the Device Management URL.



SNMP Traps

All traps from HP storage devices are received by the management station (for example, HP OpenView NNM). The integration takes the appropriate action based on the type of trap and the PDU contents. The types of traps received from HP storage devices are as follows:

- **State Change.** The device status (represented by the icon's background color) is changed to show the type of trap. The device status is changed to Unknown if the integration does not recognize the type of trap. The traps ok, warning, critical, and not recoverable change the device status to Normal, Warning, Critical, and Critical, respectively.
- **Add Device.** When this type of trap indicates the device is a host-managed device, an icon for the device is created in the NNM map. Currently, the integration does not create an icon in the NNM map when this type of trap

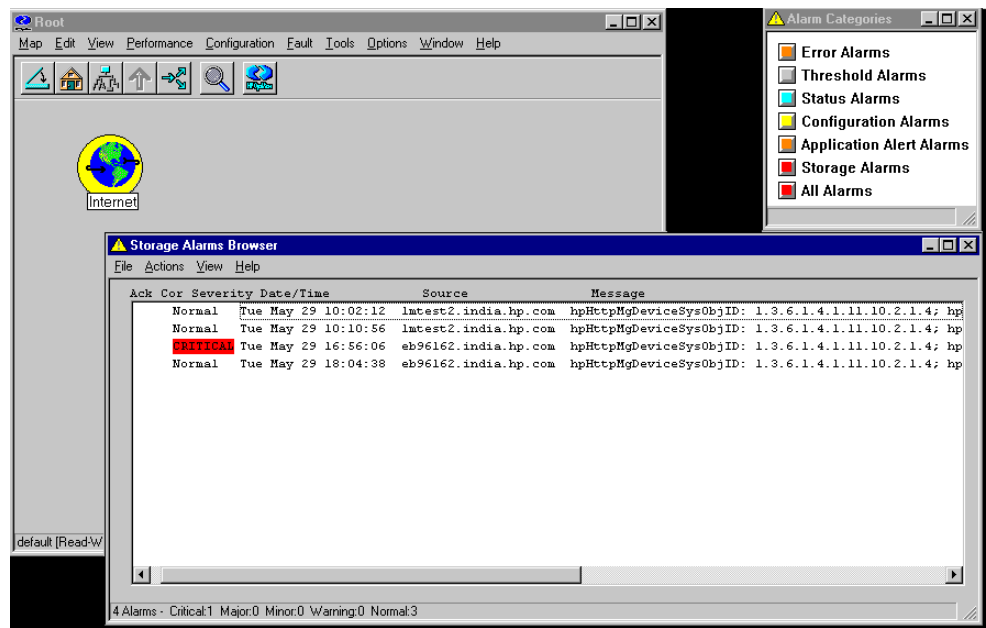
indicates the device is connected directly to the IP network. Therefore, you must manually update the NNM map to add the device's icon to the map. See ["NNM Map on page 33"](#) for instructions.

- **Delete Device.** Redraws the NNM map to show the exact number of devices and their current status.

An entry is added to the Alarm Browser each time the management station receives a trap. See [Figure 10 on page 39](#). All traps from HP storage devices are stored in the Alarm Browser's Storage Alarm category (number 7). The trap's description in the Alarm Browser contains the following information in the order shown:

Trap Type	Information Included in Description
State Change	hpHttpMgDeviceGlobalUniqueID hpHttpMgDeviceSysObjID hpHttpMgDeviceManagementURL hpHttpMgDeviceSpecificEventCode hpHttpMgDeviceSpecificFRU
Add Device	hpHttpMgDeviceGlobalUniqueID hpHttpMgDeviceSysObjID hpHttpMgDeviceManagementURL
Delete Device	hpHttpMgDeviceGlobalUniqueID hpHttpMgDeviceSysObjID

Figure 10 Alarm Browser.



Setting the Trap-Destination Address

A management station (for example, HP OpenView NNM) must be able to receive traps from the device to manage it.

To receive traps, you will need to manually add the management station's address to the device's list of trap destinations. Refer to Appendix A for help on setting trap destinations.

To identify whether or not the trap-destination address has been set, view the following log file for the machine running the management station. The log file will contain entries if the trap-destination address has NOT been set.

- Windows NT/2000 – Use the Event Viewer to view the Application Log.
- HP-UX and Solaris – View this file: `/var/opt/OV/log/
hpStorageMgmt.log`

Uninstalling the HP OpenView NNM Enterprise Integration

Uninstalling on Windows

- 1 Ensure that the NNM GUI is closed and all the NNM services are running. If any of the services are not running, use the following command to start them:

```
ovstart -v
```
- 2 Navigate to the Windows Control Panel, then double-click the Add/Remove Programs icon.
- 3 Select Storage Management enterprise integration for Openview from the list, then click the Add/Remove button.
- 4 Follow the on-screen instructions to uninstall the HP OpenView NNM enterprise integration program files.

Uninstalling on HP-UX

- 1 Ensure that the NNM GUI is closed and all the NNM services are running. If any of the services are not running, use the following command to start them:

```
ovstart -v
```
- 2 From the HP-UX 11.x node containing the Storage Management enterprise integration for Openview, enter `swremove`. This starts the swremove GUI.
- 3 Select HPStorageMgmt for uninstallation.
- 4 Mark it, then confirm the uninstallation from the Action menu item.
- 5 View the logfile to ensure a successful uninstallation.

Uninstalling on Solaris

- 1 Ensure that the NNM GUI is closed and all the NNM services are running. If any of the services are not running, use the following command to start them:

```
ovstart -v
```

- 2 On the Solaris machine on which the Storage Management enterprise integration for Openview is installed, enter the following command:

```
pkgrm HPStorage
```

When prompted to confirm the removal of the integration, enter 'y'.

- 3 When prompted to begin the uninstallation with super user permission, enter 'y'.

- 4 The uninstall process will begin. When the process is complete, the following message will be displayed:

```
Removal of <HPStorage> was successful
```

Note Uninstalling the HP OpenView NNM enterprise integration does not remove the Storage Alarms category from the Alarm Browser. You can manually remove the category from the Alarm Browser by using the HP OpenView NNM utility *xnmtraps.exe*.

CA Unicenter TNG Enterprise Integration

4

Computer Associates (CA) Unicenter TNG is a network management product that provides integrated administration of all IT resources in an enterprise. These resources can include network devices (for example, routers and hubs), databases, business applications for desktop systems and mainframes, and all servers. Unicenter TNG includes components for event management, monitoring, and controlling network elements on both IP and IPX networks.

The CA Unicenter TNG enterprise integration enables Unicenter TNG to manage HP storage devices either connected directly to an IP network or managed by a host. The integration enables Unicenter TNG to handle traps from HP storage devices and to also open their Web-based management applications in a Web browser.

Installing the CA Unicenter TNG Enterprise Integration

Prerequisites on the Unicenter TNG Station:

- Windows 2000 or Windows NT 4.0 with Service Pack 5 or above.
- 128 MB RAM
- SNMP Service installed and running.
- Computer Associates Unicenter TNG Version 2.2 for Windows NT 4.0, Version 2.4 for Windows 2000 and Version 3.00 for Windows 2000 server.

Note Installation of Unicenter 3.00 requires MicroSoft SQL Server 6.00 or above to be installed as a prerequisite.

- A web browser; either Microsoft Internet Explorer (version 5.0 or above) or Netscape.
- If applicable, HP Storage Security Certificate installed and configured. Note that security certificates are device specific; therefore, see the device's manual for information and installation instructions.

To install the CA Unicenter TNG enterprise integration:

- 1 Log on as administrator to the machine running Unicenter TNG.
- 2 Download the CA Unicenter TNG Integration for Windows to a temporary directory. See ["Downloading the Integrations on page 10"](#).
- 3 Execute the setup file and follow the on-screen instructions to complete the installation.
- 4 From a command prompt execute "caugui settings", select the tab for Event Management, find the description "users authorized to execute commands" and change the setting to *@*, restart Event Management by doing a unicntrl stop opr and then unicntrl start opr.

Using the CA Unicenter TNG Enterprise Integration

Discovering HP Storage Devices

The Unicenter TNG discovers HP storage devices using the mibII system object IDs. The integration then searches through all the Unclassified_TCP network elements discovered by Unicenter TNG for storage devices.

Once the installation is complete, the Unicenter TNG will not display icons for HP storage devices if it did not discover any of them. You can wait until the Unicenter's default discovery process discovers the devices in the consecutive polling, or you can do a manual discovery by using the following command in Unicenter TNG:

```
dscvrbe -R <repository_name> -I <IP_address>
```

where *repository_name* is the Unicenter repository name and *IP_address* is the IP address of either a HP storage device or a host that manages HP storage devices.

An HP storage device connected directly to the IP network is assumed to have RelationshipType set to *host* in its device info table. The mibII/system/sysobjID is the same as the device sysobjID in the NetCitizen mib device info table for that device. A host that manages HP storage devices is assumed to have RelationshipType set to *other* for all HP storage devices it manages.

Unicenter TNG Map

Unique icons are used in the Unicenter TNG 2D map to represent discovered HP storage devices. Icons representing host-managed devices are created in a separate submap under the icon representing the managing host. The device icon's label shows either the device's IP name (direct-connected) or global unique ID (host-managed).

The background color of a device's icon represents the status of the device. The background color of a host's icon represents the status of a device it is managing. That is, device status is propagated to the managing host's icon. The device with the most critical status determines the background color of the managing host's icon.

The current status of a device connected directly to the IP network might not be shown in the Unicenter TNG map after certain events (for example, after a

discovery or when Unicenter TNG is first started). You can get the current status by reviewing the entry `hpHttpMgDeviceHealth` in the `NetCitizen II` mib.

You can manually update a Unicenter TNG map showing previously discovered HP storage devices by stopping then starting the discovery application. For example, execute the following commands:

```
$TNGROOT\Store_pgmfiles\TerminateDiscovery.bat  
$TNGROOT\Store_pgmfiles\DiscoverStorage.exe
```

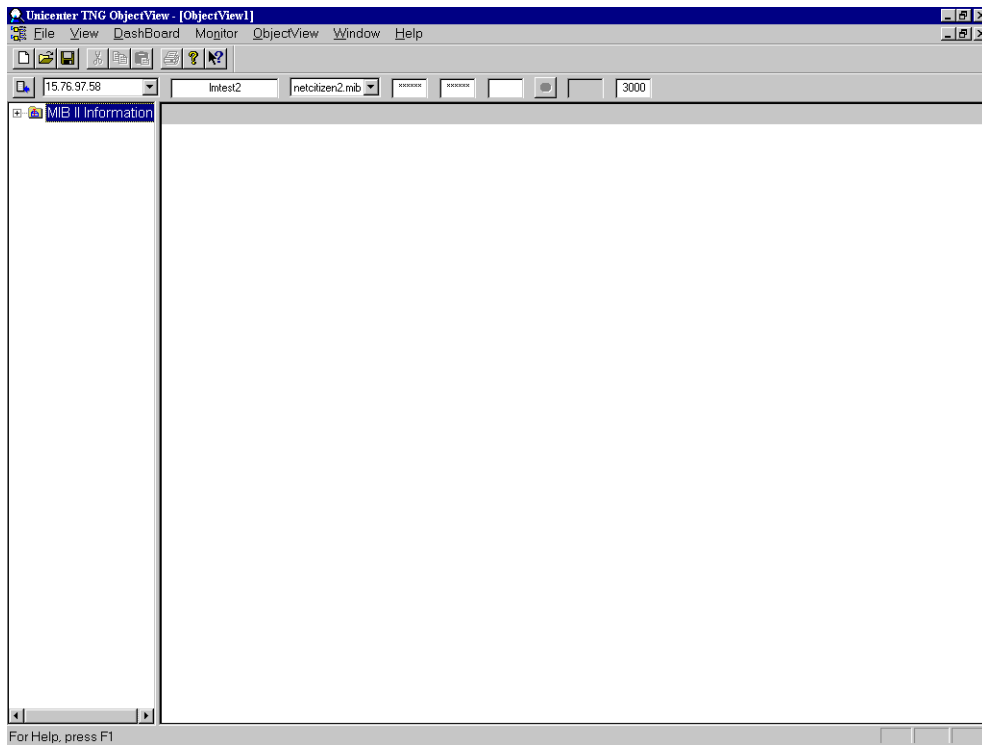
Viewing Device Information

From within Unicenter TNG, use the following steps to view information about a certain HP storage device:

- 1 Right-click a device icon in the Unicenter TNG 2D map.
- 2 Select Object View from the pop-menu.
- 3 In the ObjectView window (MIB Browser), select Vendor Information.

Note The HP OpenView NNM enterprise integration cannot configure device information for HP storage devices that do not support SNMP set operations.

Figure 11 ObjectView Window.

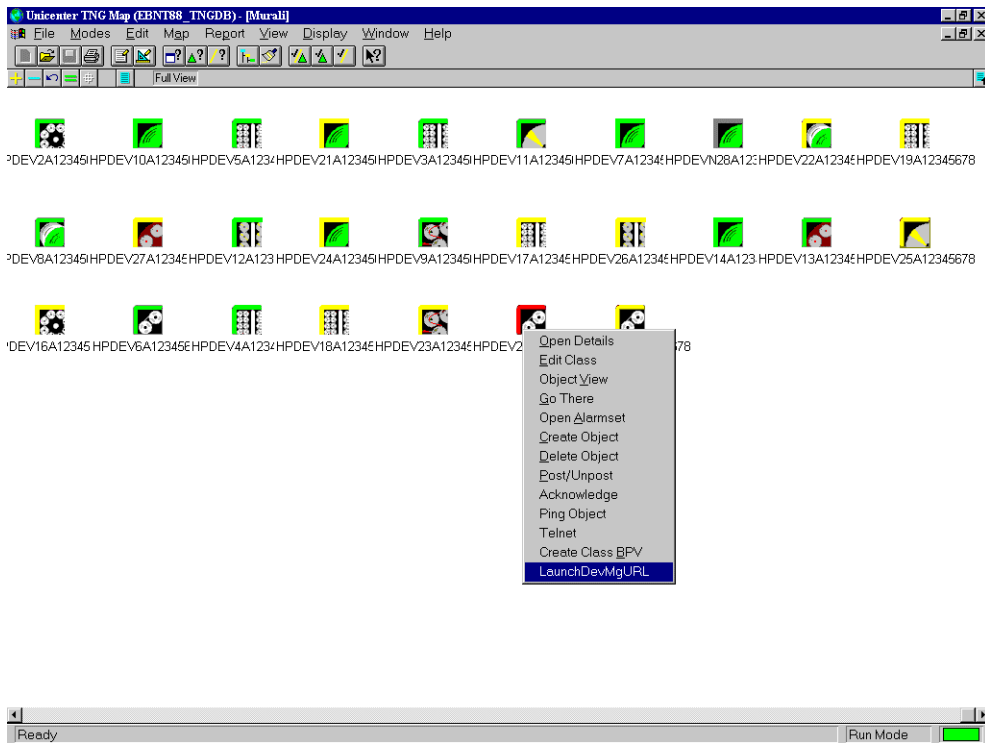


Launching the Device Management URL

From within Unicenter TNG, use the following steps to launch the device management URL for an HP storage device:

- 1 Right-click a device icon in the Unicenter TNG 2D map.
- 2 Select LaunchDevMgURL from the pop-menu.

Figure 12 Launching the Device Management URL.



SNMP Traps

All traps from HP storage devices are received by the management station (for example, Unicenter TNG). The integration takes the appropriate action based on the type of trap and the PDU contents. The types of traps received from HP storage devices are as follows:

- **State Change.** The device status (represented by the icon's background color) is changed to show the type of trap. The device status is changed to Unknown if the integration does not recognize the type of trap. The traps ok, warning, critical, and not recoverable change the device status to Normal, Warning, Critical, and Critical, respectively.
- **Add Device.** When this type of trap indicates the device is a host-managed device, an icon for both the host (if not already shown in the map) and device is created in the Unicenter TNG map. When the trap indicates the

device is connected directly to the IP network, an icon for only the device is created in the Unicenter TNG map.

Currently, the integration fails to take action on this type of trap when a discovery or SetTrapDestination is in progress.

- **Delete Device.** Redraws the Unicenter TNG map to show the exact number of devices and their current status.

Currently, the integration fails to take action on this type of trap when a discovery or SetTrapDestination is in progress.

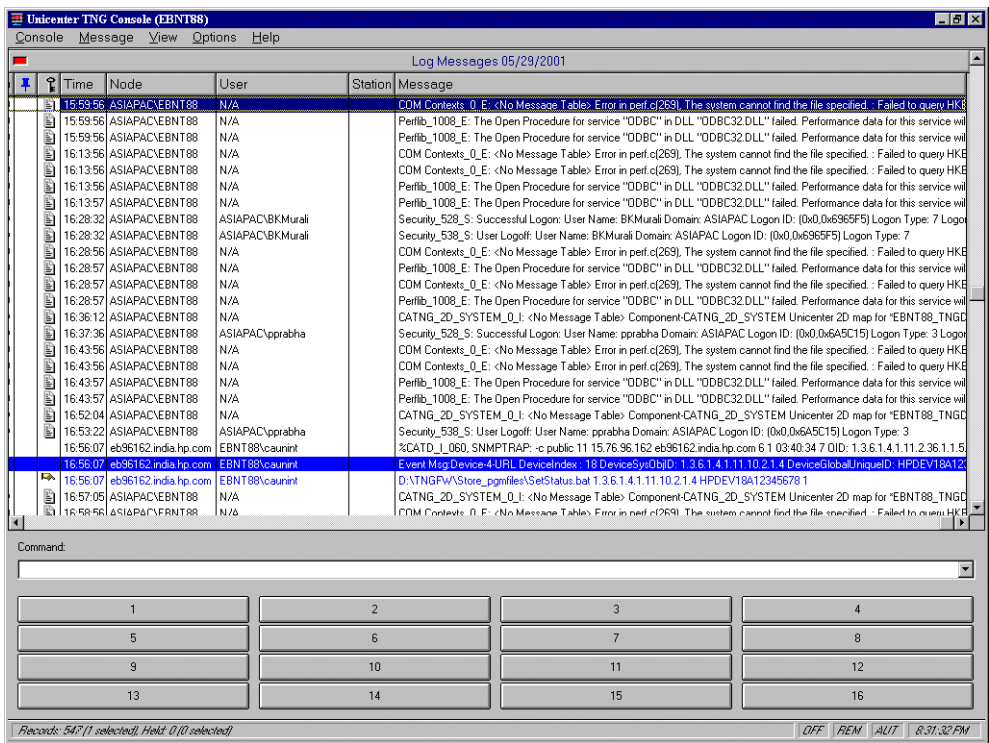
An entry is added to the Unicenter TNG Console. each time the management station receives a trap. See [Figure 13 on page 50](#). The trap contains the following information:

- device sysobjID
- global uniqueID
- device index
- device-specific event code
- FRU
- management station's URL
- URL label

Use the following steps to open the Unicenter TNG Console:

- 1 From the Programs menu, select Unicenter TNG Framework >>Enterprise Managers.
- 2 From the menu, double-click WindowsNT.
- 3 Double-click Event.
- 4 From the menu, double-click Console Logs.

Figure 13 Unicenter TNG Console.



Setting the Trap-Destination Address

A management station (for example, Unicenter TNG) must be able to receive traps from the device to manage it.

To receive traps, you will need to manually add the management station's address to the device's list of trap destinations. Refer to Appendix A for help on setting trap destinations.

To identify whether or not the trap-destination address has been set, view the following log file for the machine running the management station. The log file will contain entries if the trap-destination address has NOT been set.

The integration logs the following message (with a blue highlight) in the Unicenter TNG Console when a management station's address could not be added to the device's list of trap destinations.

```
Could not set trap destination table entry for ip:  
<xx.xx.xx.xx>.  
Please set it manually.
```

Uninstalling the CA Unicenter TNG Enterprise Integration

To uninstall the CA Unicenter TNG enterprise integration, use the Windows deinstallation program.

To uninstall the CA Unicenter TNG enterprise integration:

- 1** Go to the Windows Control Panel, then double-click the Add/Remove Programs icon.
- 2** Select CA Unicenter TNG Enterprise Integration from the list, then click the Add/Remove button.
- 3** Follow the on-screen instructions to uninstall the CA Unicenter TNG enterprise integration program files.

HP OpenView VPO Enterprise Integration

5

HP OpenView Vantage Point Operations (VPO) is a network management product that provides integrated administration of all IT resources in an enterprise. These resources can include network devices, such as routers and hubs, databases, business applications for desktop systems and mainframes, and all servers. OpenView includes components for event management (SNMP traps), monitoring (SNMP gets), and controlling (SNMP sets) network elements on both IP and IPX networks.

The HP Open View VPO Storage enterprise integration enables the VPO to discover HP Storage Devices. From within HP Open View VPO Node Bank, you can manage any HP Storage devices connected to the IP Network or managed by Device Management stations.

Installing the HP OpenView VPO Enterprise Integration

Prerequisites on the HP OpenView Vantage Point Operations:

- One of the following operating systems:
 - HPUX 11.x
 - Sun Solaris 2.8
- HP 9000 Technical Workstation or HP 9000 Enterprise Server, with at least one HP-supported X terminal or workstation.
- 256 MB RAM.
- 600 MB Swap space
- 1.6 GB Hard Disk
- SNMP Service installed and running
- HP Open View Vantage Point Operations version A.6.00 (HP UX 11.x).
- A web browser Netscape 4.75 or above.

Installing on HP-UX 11.x

- 1 Log on to an HP-UX 11.x host that is running HP OpenView VPO.
- 2 Download the HP OpenView VantagePoint Operations Integration for HP-UX to a temporary directory. See ["Downloading the Integrations on page 10"](#).
- 3 Ensure that the HP OpenView services have been started, and then close the HP OpenView VPO GUI.
- 4 Install the HP OpenView VPO enterprise integration for HP-UX by entering

```
% swinstall -s /tmp/work/StorageMgmt.depot HPStorageMgmt
```
- 5 When the installation is running, check the logfile by typing:

```
tail -f /var/adm/sw/swagent.log
```

If any errors occurred during the installation, they will be recorded in the log file.
- 6 Open the HP OpenView VPO GUI.

Note You might see the following error when opening the GUI:

```
Error: Unknown field "isStorageDevice"
```

This error should disappear after subsequent opening of the GUI. HP OpenView VPO is updating all of its data and registration repositories about the HP Command View SDM Station during this initial installation.

Installing on Solaris 2.8

- 1 Log on to an Solaris host that is running HP OpenView VPO as root.
- 2 Download the HP OpenView VantagePoint Operations Integration for Solaris to a temporary directory. See ["Downloading the Integrations on page 10"](#).
- 3 Ensure that the HP OpenView services have been started, and then close the HP OpenView VPO GUI.
- 4 Install the HP OpenView VPO enterprise integration for Solaris by entering

```
% cd /tmp/work
% pkgadd -d HPStorageMgmt_VPO.pkg HPStorage
```
- 5 When prompted for a permission to run the scripts with super user permission; enter 'y'.
- 6 The installation process will begin. When the process is complete, the following message will be displayed:

```
Installation of <HPStorage> was successful
```
- 7 Open the HP OpenView VPO GUI to start managing the Storage Devices.

Configuring the VPO Enterprise Integration

- 1 Start the VPO GUI.
- 2 Open the Application Bank. Drag the HP Storage Management icon to the to OV Services icon to move the application.
- 3 Open the Node Bank, Node Group Bank and assign the storage device to be managed to node group HP Storage Devices.

- 4 Open the User Bank, User Profile Bank and assign the profile "hpstorage_op" to user opc_adm.
- 5 Close the VPO GUI and restart the session

Note The above procedure makes the integration visible to user opc_adm. To make the integration visible to other users, see ["User Profile Bank on page 59"](#).

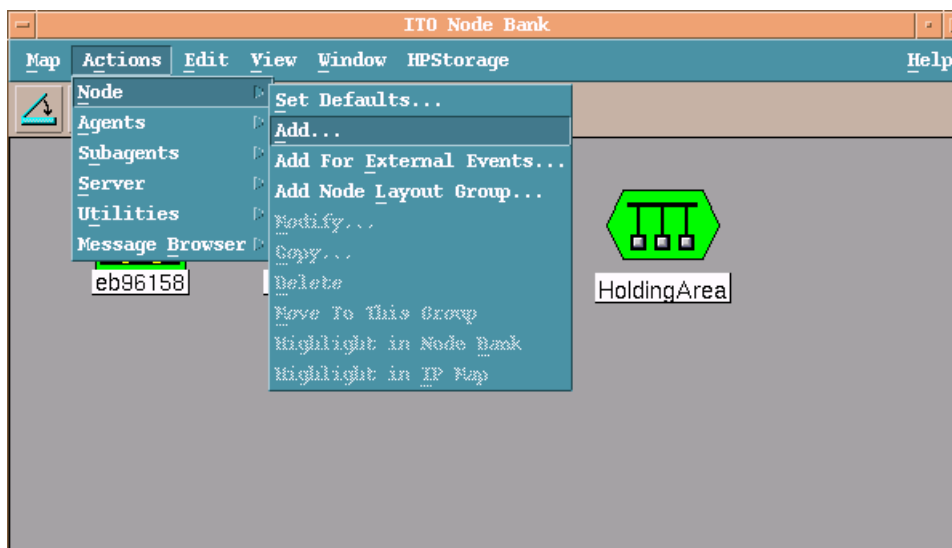
Using the HP OpenView VPO Enterprise Integration

Node Bank

Managed nodes are computers which are controlled and monitored by VPO. VPO agent software is installed on these nodes. Managed nodes are kept in a Node Bank. Nodes are assigned to a node group depending upon the OS installed on the managed node.

- 1 Log in as administrator and open the Node Group Bank GUI.
- 2 Add the node to be managed to the node bank. Use the host for host managed devices ,and the IP address for standalone devices.
- 3 Assign a node to Node Group “HP Storage Devices” by dragging the node icon to the HP Storage Devices icon.

Figure 14 Node Bank

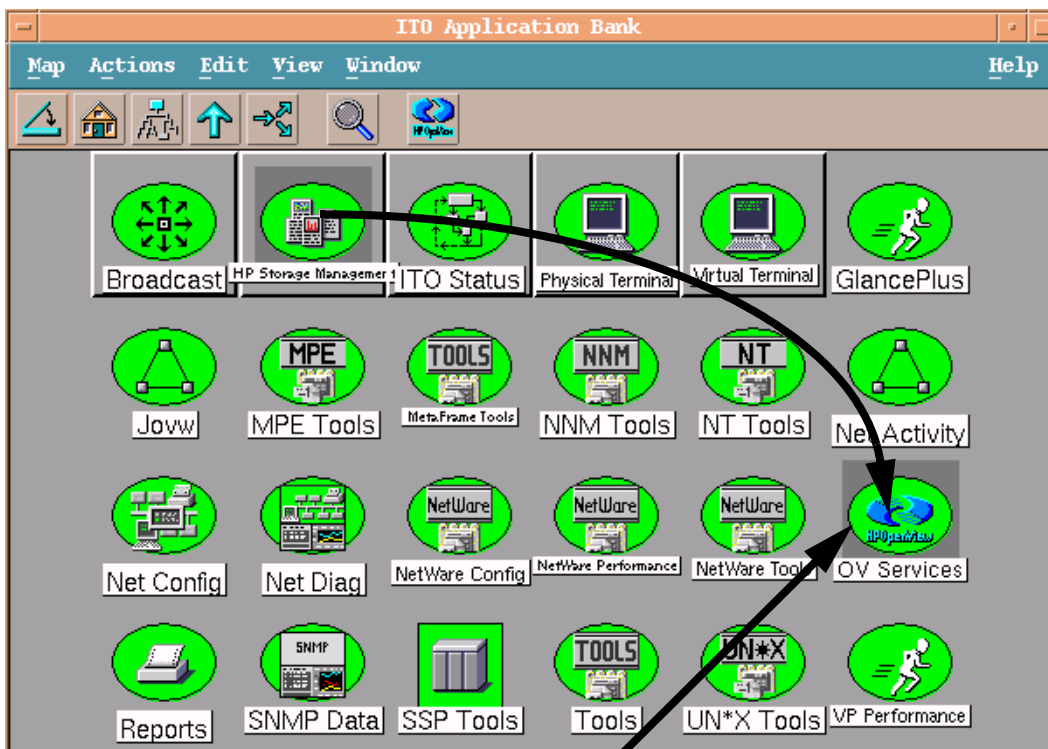


Application Bank

During installation, the VPO enterprise integration is loaded as application “HP Storage Management”. To make the menu item “HPStorage” visible, it must be moved to OV Services.

- 1 Start VPO GUI.
- 2 In the Application Bank, drag the HP Storage Management icon to the OV Services icon to move the application

Figure 15 Application Bank



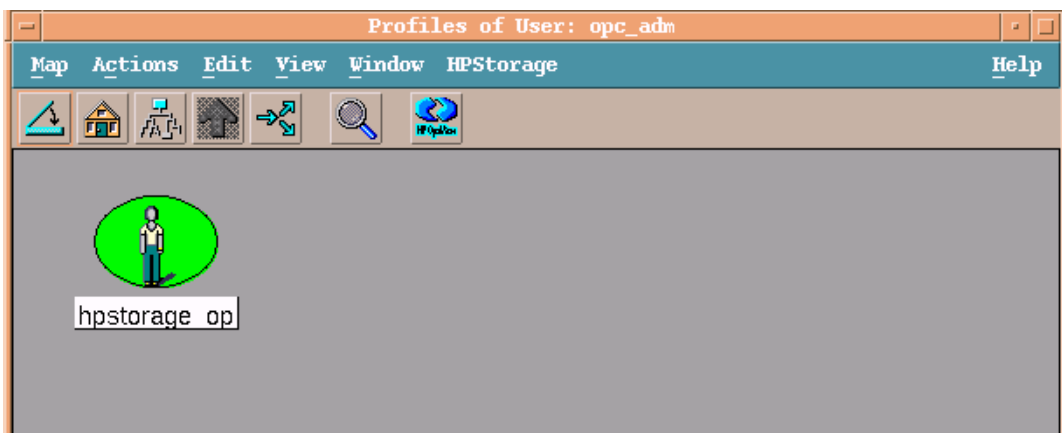
Drag the HP Storage Management icon
to the OV Services icon

User Profile Bank

The VPO user concept distinguishes between real users, such as the VPO administrator and the VPO operators, and user profiles. The VPO administrator is primarily responsible for installing and configuring the VPO software, and establishing the initial operating policies and procedures. During installation an hpstorage integration specific user profile “hpstorage_op” is added. To make the integration visible for any user (for example opc_adm) administrator must do the following steps

- 1 Open the User Bank GUI
- 2 Right click on User opc_adm
- 3 Select Modify, it opens the GUI shown in [Figure 16](#).
- 4 Double click on profile
- 5 Open the user profile bank
- 6 Drag and drop the profile from user profile bank hpstorage_op to GUI profile of user opc_adm
- 7 Close the user profile bank and GUI profile of User: opc_adm.
- 8 Click OK in GUI Modify User : Opc_adm

Figure 16 User Profile Bank



Discovering HP Storage Devices

The HP OpenView IP Map discovers HP storage devices by querying the systems discovered by `netmon` for the existence of a device info table. The queried system returns a value for the table entry if it is a supported HP storage device either connected directly to the IP network or managed by a host.

Once the installation is complete, the HP OpenView IP Map will not display icons for HP storage devices until they are discovered. You can wait until the IP Map default discovery process discovers the devices in the consecutive polling, or you can do a manual discovery by executing the following sequence of commands on the host running the HP OpenView IP Map:

```
loadhosts -c IP_address
ovtopodump IP_address
nmdemandpoll IP_address
```

where `IP_address` is either the IP address of an HP storage device connected directly to the IP network or the IP address of a host that manages HP storage devices.

An HP storage device connected directly to the IP network is assumed to have `RelationshipType` set to *host* in its device info table. The `mibII/system/sysobjID` is the same as the device `sysobjID` in the device info table for that device. A host that manages HP storage devices is assumed to have `RelationshipType` set to *other* for all HP storage devices it manages.

IP Map Configuration

Unique icons are used in the IP map to represent HP storage devices. Icons representing host-managed devices are created in a separate submap under the icon representing the host. The device icon label shows either the device IP address (direct-connected) or global unique ID (host-managed).

The background color of a device's icon represents the status of the device. The background color of a host icon is set by the `netmon` process and does not change to show device status. Device status is not propagated to the managing host icon.

The current status of a device connected directly to the IP network might not be shown in the IP Map after certain events. For example, after a `netmon` discovery or when the HP OpenView VPO is first started. You must manually update the IP map to obtain the device current status.

You can manually update an IP map showing previously discovered HP storage devices. To update the map:

- 1 Right-click an icon for either a direct-connected device or managing host.
- 2 Select Discover Storage from the pop-up menu.

You can also select an icon for either a direct-connected device or managing host, then select Discover Storage from the HPStorage pull-down menu.

Figure 17 IP Map



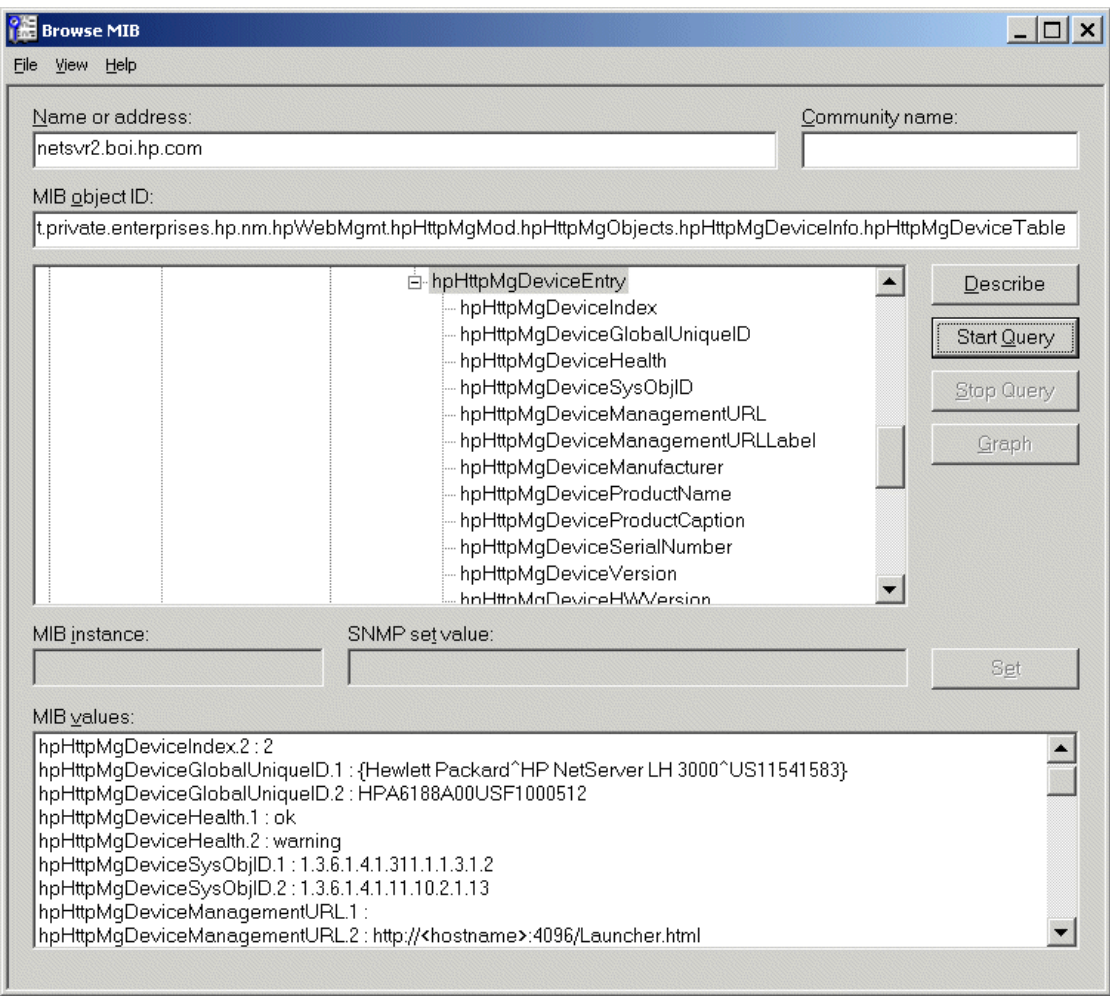
Viewing Device Information

From within VPO IP Map, you can view information about any HP storage device.

- 1 From the Tools pull-down menu, select SNMP MIB Browser.
- 2 In the Browse MIB window, type either the DNS name or IP address of a direct-connected device or managing host.
- 3 Select the entry `hpHttpMgDeviceTable`, then click Start Query. The device information is shown in the MIB values box.

Note The HP Open View VPO enterprise integration cannot configure device information for HP storage devices that do not support SNMP set operations. Refer to your product documentation to determine if your product supports this feature.

Figure 18 Device Information



User-Initiated Discovery Storage Devices

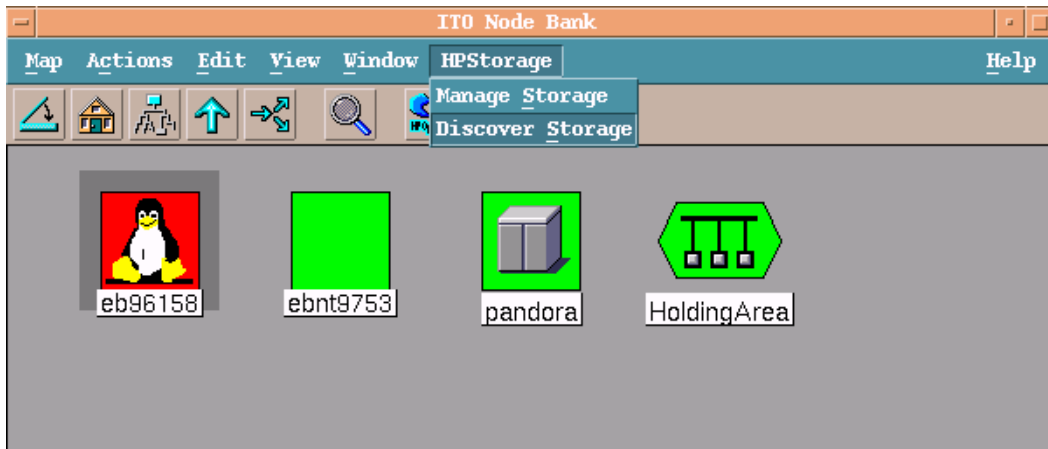
The process for discovering storage devices can be initiated manually for both direct connect devices and devices connected to a host.

- 1 Click on storage device or the host managing the devices.

- 2 Select HPStorage menu and select on Discover Storage.

An updated map will be drawn reflecting any newly discovered devices.

Figure 19 Discovering Devices



Launching the Device Management Web GUI

From within the Node Bank GUI, you can launch the device management web GUI to perform device management.

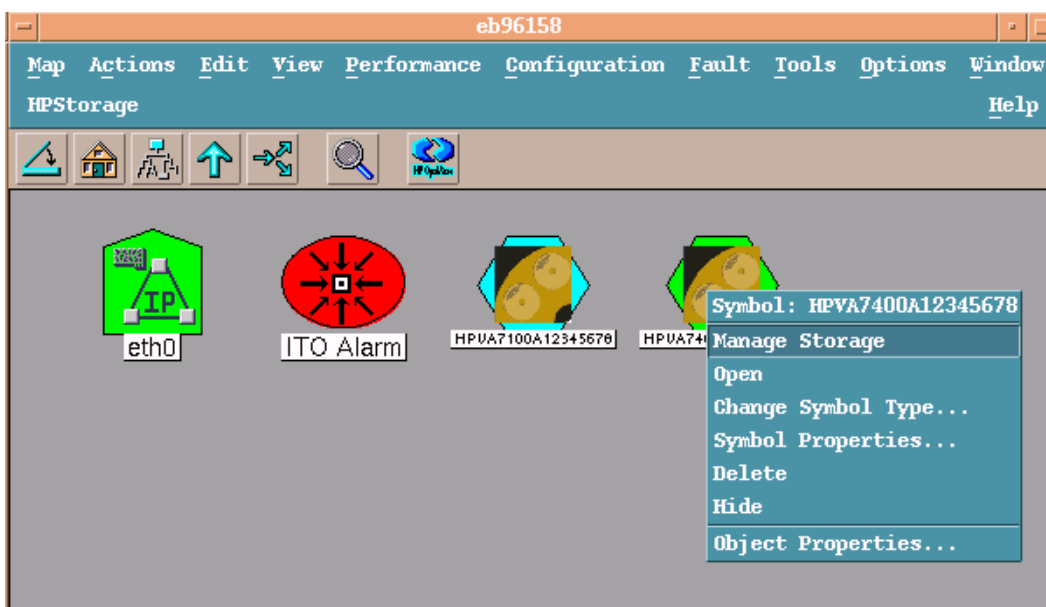
- 1 In the Node Bank GUI, double-click a host icon. This displays icons for all of the HP storage devices connected to that host.
- 2 Right-click one of the device icons, then select Manage Storage from the popup menu.

You can also select a device icon, and then select Manage Storage from the HPStorage drop-down menu.

Note

The Manage Storage menu option is not available if a host is selected. A storage device connected to the host must be selected before this option is available.

Figure 20 Launching Device Management Web GUI



SNMP Traps

All traps from HP storage devices are received by the management station (for example, HP OpenView VPO). The integration takes the appropriate action based on the type of trap and the contents. The types of traps received from HP storage devices are as follows:

- **State Change.** The device status (represented by the icon's background color) is changed to show the type of trap. The device status is changed to Unknown if the integration does not recognize the type of trap. The traps ok, warning, critical, and not recoverable change the device status to Normal, Warning, Critical, and Critical, respectively.
- **Add Device.** When this type of trap indicates the device is a host-managed device, an icon for the device is created in the IP map. Currently, the integration does not create an icon in the IP map when this type of trap indicates the device is connected directly to the IP network. Therefore, you must manually update the IP map to add the device's icon to the map. See ["IP Map Configuration on page 60"](#).

- **Delete Device.** Redraws the IP map to show the exact number of devices and their current status.

A message is displayed in the Message Browser each time the management station receives a trap. All traps from HP storage devices are displayed in the Message Browser under message group "HP_Storage" and application "HP Storage Management". Message displays the severity, date, time, sending node, application, message group and target object of the trap. User can see the details of traps by double clicking on the message. The trap's description in the Message Browser contains the following information in the order shown:

Trap Type	Information Included in Description
State Change	hpHttpMgDeviceGlobalUniquelD hpHttpMgDeviceSysObjID hpHttpMgDeviceManagementURL hpHttpMgDeviceSpecificEventCode hpHttpMgDeviceSpecificFRU
Add Device	hpHttpMgDeviceGlobalUniquelD hpHttpMgDeviceSysObjID hpHttpMgDeviceManagementURL
Delete Device	hpHttpMgDeviceGlobalUniquelD HpHttpMgDeviceSysObjID

Figure 21 Event Listing

Sev. Dup.	SUIAONE	Date	Time	Node	Application	MsgGroup	Object
Norm	-----	09/11/01	11:55:53	pandora.in	HP Storage	HP_Storag	
Warn	--X----	09/11/01	11:56:33	eb96158.in	HP Storage	HP_Storag	1.3.6.1
Norm	-----	09/11/01	13:07:44	pandora.in	HP Storage	HP_Storag	
Norm	-----	09/11/01	13:07:45	pandora.in	HP Storage	HP_Storag	
Norm	-----	09/11/01	13:08:07	pandora.in	HP Storage	HP_Storag	
Norm	-----	09/11/01	13:08:20	pandora.in	HP Storage	HP_Storag	
Norm	-----	09/11/01	13:08:20	pandora.in	HP Storage	HP_Storag	
Norm	-----	09/11/01	13:08:25	pandora.in	HP Storage	HP_Storag	
Warn	--X----	09/11/01	14:56:27	eb96158.in	HP Storage	HP_Storag	1.3.6.1
Norm	--X----	09/11/01	14:57:12	eb96158.in	HP Storage	HP_Storag	1.3.6.1
Crit	--X----	09/11/01	14:57:33	eb96158.in	HP Storage	HP_Storag	1.3.6.1
Crit	--X----	09/11/01	14:57:57	eb96158.in	HP Storage	HP_Storag	1.3.6.1
Crit	--X----	09/11/01	14:58:19	eb96158.in	HP Storage	HP_Storag	1.3.6.1
Norm	--X----	09/11/01	14:58:38	eb96158.in	HP Storage	HP_Storag	1.3.6.1
Warn	--X----	09/11/01	14:58:55	eb96158.in	HP Storage	HP_Storag	1.3.6.1
Crit	--X----	09/11/01	14:59:16	eb96158.in	HP Storage	HP_Storag	1.3.6.1
Norm	--X----	09/11/01	14:59:37	eb96158.in	HP Storage	HP_Storag	1.3.6.1
Warn	--X----	09/11/01	14:59:59	eb96158.in	HP Storage	HP_Storag	1.3.6.1

13

0

0

12

278

0

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0

Own

Highlight

Details...

Perform Action

Annotations

Acknowledge

Figure 22 Event Details

Message Details			
Node	eb96158.india.hp.com	Severity	
Application	HP Storage Management	Service Name	
Message Group	HP Storage	Message Key	
Object	1.3.6.1.4.1.11.10.2.1.2	Message Type	
Source	SnmpTrap:SEMI Traps	Time Created	
Annotations		Time Received	
Attributes		Number of Du	
Message ID	a3d10e-a697-71d5-18ae-0f4c61c20000	Time Last Rece	
Forwarding Manager		Owned by	
Message Text			
1.4.1.11.10.2.1.2 ;hpHttpMgDeviceManagementURL: http://www.yahoo.com ;hpHttpMgDev			
Actions			
	Status	Node	Command
Automatic			
Operator Initiated			
Notification			
Trouble Ticket	No		
Escalations			

Setting the Trap-Destination Address

A management station (for example, HP OpenView VPO) must be able to receive traps from the device to manage it.

To receive traps, you will need to manually add the management station's address to the device's list of trap destinations. Refer to Appendix A for help on setting trap destinations.

To identify whether or not the trap-destination address has been set, view the following log file for the machine running the management station. The log file will contain entries if the trap-destination address has NOT been set.

- HP-UX: View this file: /var/opt/OV/log/hpStorageMgmt.log

Uninstalling the HP OpenView VPO Enterprise Integration

Uninstalling on HP-UX 11.x

The HP OpenView Vantage Point Operations GUI must be closed to uninstall the HP OpenView VPO enterprise integration.

To uninstall the HP OpenView VPO enterprise integration:

- 1 Make sure the VPO (NNM) Services has been started.
- 2 Start the VPO GUI
 - a From the Message Group Bank delete HP_Storage.
 - b From the OV Services in the Application Bank delete HP Storage Management.
 - c From the User Profile Bank delete hpstorage_op.
- 4 Shut down the VPO graphical user interface program.
- 5 Uninstall the package by typing
 - 6 When the uninstallation is running, check the logfile by typing:

```
% swremove HPStorageMgmt
```

```
tail -f /var/adm/sw/swagent.log
```

If any errors occurred during the uninstall, they will be recorded in the log file.

Uninstalling on Solaris 2.8

The HP OpenView Vantage Point Operations GUI must be closed to uninstall the HP OpenView VPO enterprise integration. To uninstall VPO enterprise integration on Solaris 2.8:

- 1 Make sure the VPO (NNM) Services has been started.
- 2 Start the VPO GUI:
 - a From the Message Group Bank delete HP_Storage.
 - b From the OV Services in the Application Bank delete HP Storage Management.

- c From the User Profile Bank delete hpstorage_op.
- 3 Shut down the VPO graphical user interface program.
- 4 Uninstall the package by typing

```
% pkgrm HPStorage
```

When prompted to confirm the removal of the integration, enter 'y'.

- 5 When prompted to begin the uninstallation with super user permission; enter 'y'.
- 6 The uninstall process will begin. When the process is complete, the following message will be displayed:

```
Removal of <HPStorage> was successful
```


IBM Tivoli NetView Enterprise Integration



Tivoli's NetView is a network management product that provides integrated administration of all IT resources in an enterprise. These resources can include network devices (for example, routers and hubs), databases, business applications for desktop systems and mainframes, and all servers. NetView includes components for event management, monitoring, and controlling network elements on both IP and IPX networks.

The Tivoli NetView Storage enterprise integration enables the NetView to manage HP storage devices either connected directly to an IP network or managed by a host. The integration enables the NetView to handle traps from HP storage devices and to launch their web-based software in a Web browser.

Installing the Tivoli NetView Enterprise Integration

Prerequisites on the Tivoli NetView Station

- Tivoli FrameWork 3.6 (or above)
- Tivoli NetView 6.00 running on one of the following operating systems:
 - Sun Solaris 2.6 or 2.7
 - AIX 4.1.5 – 4.3.3
- SNMP Service installed and running.
- Netscape 4.75 (or above).
- 128 MB RAM
- 256 MB swap space
- If applicable, HP Storage Security Certificate installed and configured.
Note that security certificates are device specific; therefore, see the device's user's manual for information and installation instructions.

Installing on Solaris

- 1 Log on to a Solaris machine with Tivoli NetView version 6.00 installed.
- 2 Download the Tivoli NetView 6.0 Integration for Solaris to a temporary directory. See "[Downloading the Integrations on page 10](#)".
- 3 Ensure that all Tivoli NetView services have been started. If any of the services are not running, use the following command to start them:

```
% /usr/OV/bin/ovstart -c
```
- 4 Close the NetView GUI if it is open.
- 5 Start the installation by entering the following command

```
pkgadd -d HPStorage_NetView.pkg HPStorage
```
- 6 When prompted for a permission to run the scripts with super user permission, enter 'y'.
- 7 The installation process starts. When the process is complete, the following message will be displayed:

```
Installation of <HPStorage> was successful
```


- 8 Create a file named `ovweb.conf` in the directory `/usr/OV/bin/HPStorage`. Specify the path of the browser in this file. For example, if path is `/opt/netcape/netcape`, then `ovweb.conf` contains `/opt/netcape/netcape`.
- 9 Open the Tivoli NetView GUI to start managing the storage devices.

Installing on AIX

- 1 Log on to a AIX machine with Tivoli NetView version 6.00 installed.
- 2 Download the Tivoli NetView 6.0 Integration for AIX to a temporary directory. See ["Downloading the Integrations on page 10"](#).
- 3 Ensure that all Tivoli NetView services have been started. If any of the services are not running, use the following command to start them:

```
/usr/OV/bin/ovstart -c
```
- 4 Close the NetView GUI if it is open.
- 5 Start the installation by typing the following command:

```
installp -ac -d HPStorage_NetView.bff HPStorage
```
- 6 The installation process starts. When the process is complete, the following message and Installation Summary will be displayed:

```
Successfully installed <HPStorage>
```
- 7 Create a file named `ovweb.conf` in directory `/usr/OV/bin/HPStorage`. Specify the path of the browser in this file. For example, if path is `/usr/local/netcape/netcape_aix4`, then `ovweb.conf` contains `/usr/local/netcape/netcape_aix4`.
- 8 Open the Tivoli NetView GUI to start managing the storage devices.

Using the Tivoli NetView Storage Enterprise Integration

Discovering HP Storage Devices

The Tivoli NetView discovers HP storage devices by querying the systems discovered by netmon for the existence of a device info table. The queried system returns a value for the table entry if it is a supported HP storage device either connected directly to the IP network or managed by a host. Once the installation is complete, NetView will not display icons for HP storage devices if it did not discover any of them. You can wait until the NetView default discovery process discovers the devices in the consecutive polling, or you can do a forced discovery by executing this sequence of commands on the node running NetView:

```
loadhosts -c IP_address  
ovtopodump IP_address  
nmdemandpoll IP_address
```

IP_address is either the IP address of an HP storage device connected directly to the IP network or the IP address of a host that manages HP storage devices.

Tivoli NetView Map

Unique icons are used in the NetView map to represent discovered HP storage devices. Icons representing host-managed devices are created in a separate submap under the icon representing the managing host. The device icon's label shows either the device's IP name (direct-connected) or global unique ID (host-managed).

The background color of a device's icon represents the status of the device. The background color of a host's icon is set by the netmon process and does not change to show device status. That is, device status is not propagated to the managing host's icon.

The current status of a device connected directly to the IP network might not be shown in the NetView map after certain events (for example, after a netmon discovery or when the NetView is first started). You must manually update the NetView map to obtain the device's current status.

You can manually update a NetView map showing previously discovered HP storage devices. To update the map, right-click an icon for either a direct-connected device or managing host, then select HP Storage > Discover Storage from the pop-up menu. You can also select an icon for either a direct-connected device or a host managing a device, then select HP Storage > Discover Storage from the Tools pull-down menu.

Figure 23 Tivoli NetView Map



Viewing Device Information

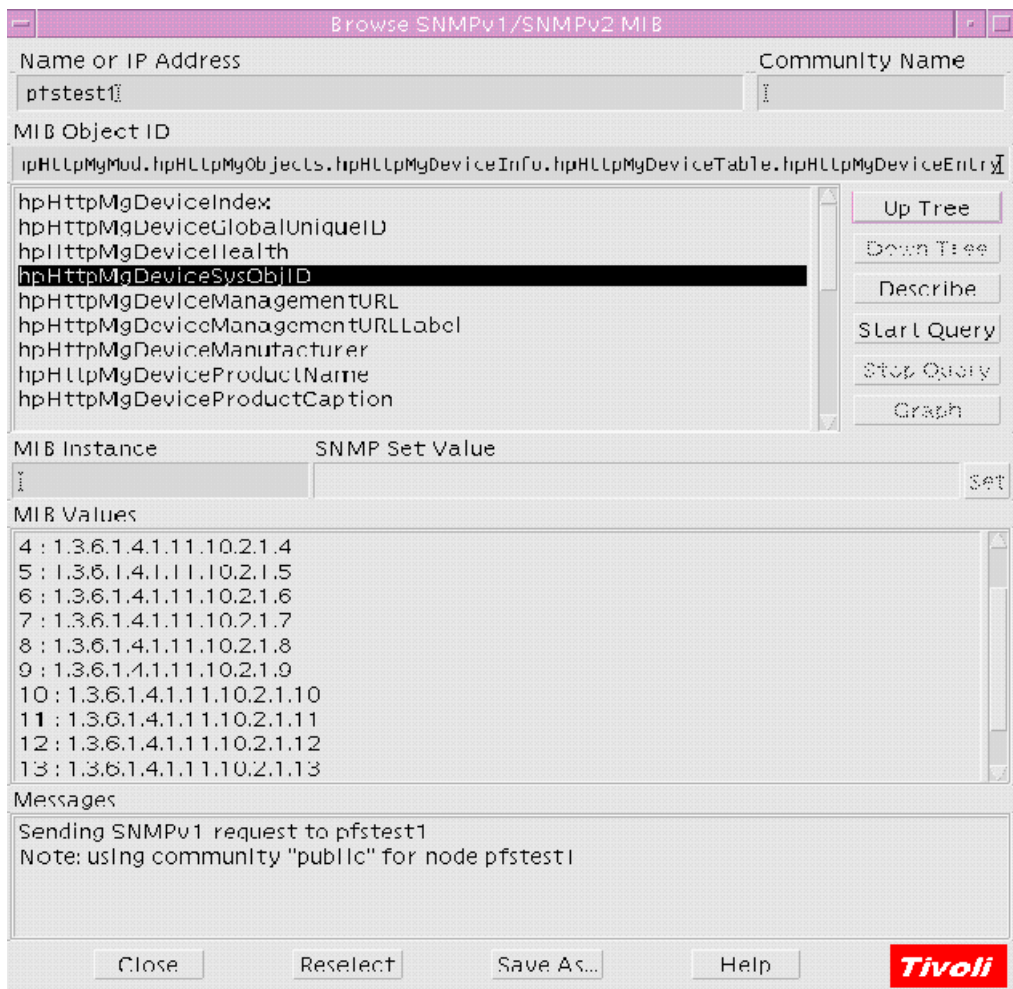
From within Tivoli NetView, use the following steps to view information about a certain HP storage device:

- 1 From the Tools pull-down menu, select MIB Browser ->SNMPv1/SNMPv2
- 2 In the Browse MIB window, type either the DNS name or IP address of a direct-connected device or managing host.

- 3 Select the entry `hpHttpMgDeviceTable`, then click Start Query. The device information is shown in the MIB values box.

Note The Tivoli NetView Storage enterprise integration cannot configure device information for HP storage devices that do not support SNMP set operations.

Figure 24 MIB Browser

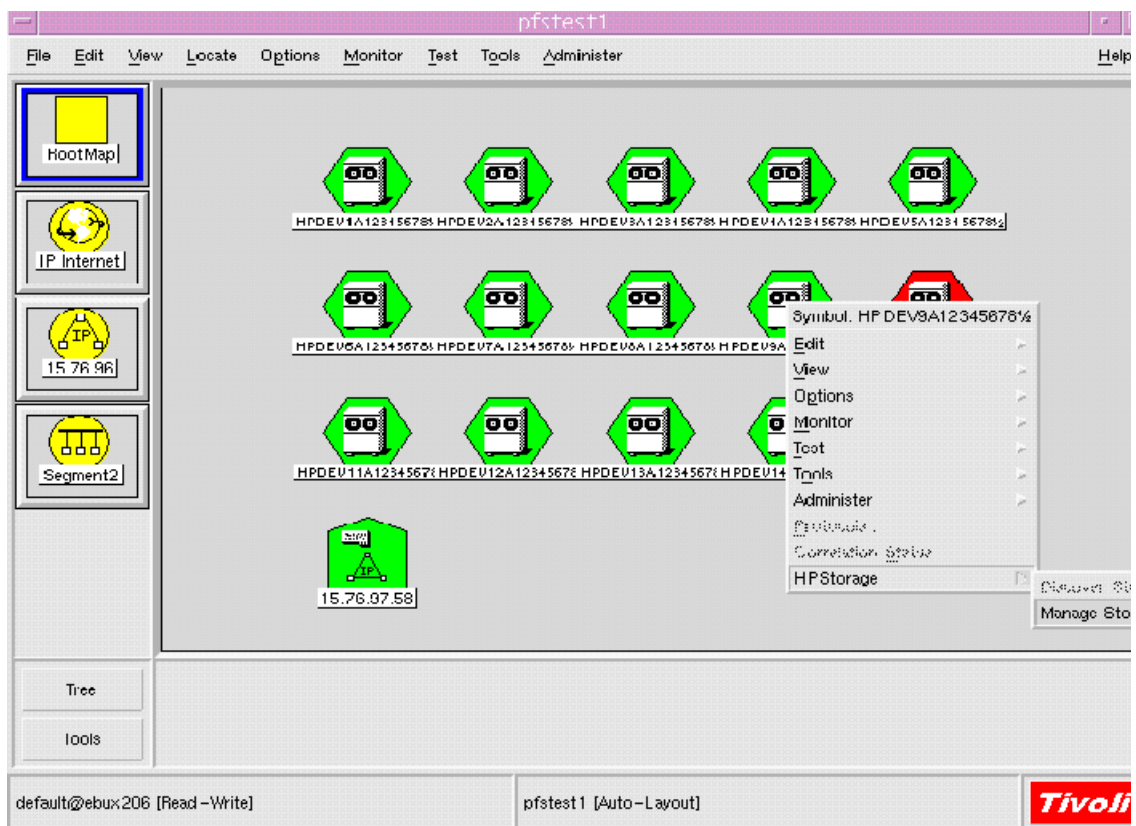


Launching the Device Management URL

From within Tivoli NetView, use the following steps to launch the device management URL:

- 1 From the Tivoli NetView GUI, double-click a host icon. This displays icons for all of the HP storage devices connected to that host.
- 2 Right-click one of the device icons, then select HPStorage > Manage Storage from the popup menu. You can also select a device icon, then select HPStorage > Manage Storage from the Tools drop-down menu.

Figure 25 Launching the Device Management URL



SNMP Traps

All traps from HP storage devices are received by Tivoli NetView. The integration takes the appropriate action based on the type of trap and the PDU contents. The types of traps received from HP storage devices are as follows:

State Change. The device status (represented by the icon's background color) is changed to show the type of trap. The device status is changed to Unknown if the integration does not recognize the type of trap. The traps ok, warning, critical, and not recoverable change the device status to Normal, Warning, Critical, and Critical, respectively.

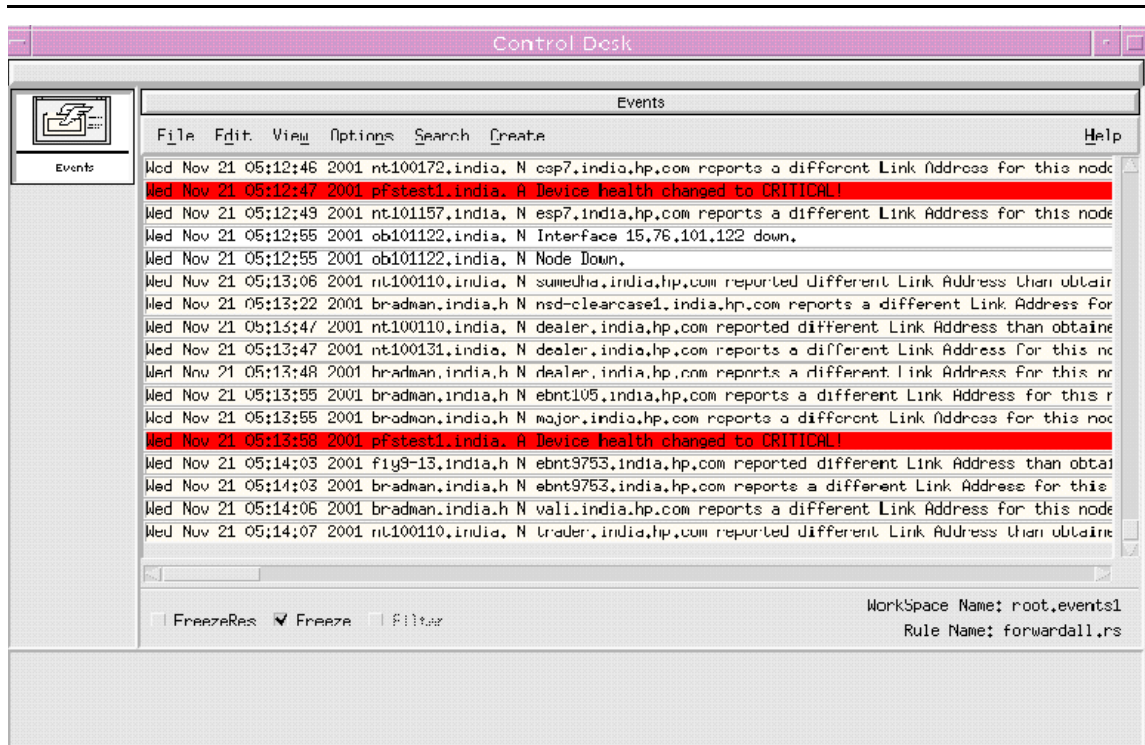
Add Device. When this type of trap indicates the device is a host-managed device, an icon for the device is created in the NetView map. Currently, the integration does not create an icon in the NetView map when this type of trap indicates the device is connected directly to the IP network. Therefore, you must manually update the NetView map to add the device's icon to the map.

Delete Device. Redraws the NetView map to show the exact number of devices and their current status.

An entry is added to the nvevents (Event Browser) each time the management station receives a trap. See [Figure 26](#). All traps from HP storage devices are shown as Status Events in the Event Browser. The trap's description in the Events Browser contains the following information in the order shown:

Trap Type	Information Included in Description
State Change	HpHttpMgDeviceGlobalUniqueID hpHttpMgDeviceSysObjID hpHttpMgDeviceManagementURL hpHttpMgDeviceSpecificEventCode hpHttpMgDeviceSpecificFRU
Add Device	HpHttpMgDeviceGlobalUniqueID hpHttpMgDeviceSysObjID hpHttpMgDeviceManagementURL
Delete Device	HpHttpMgDeviceGlobalUniqueID HpHttpMgDeviceSysObjID

Figure 26 Event Browser



Setting the Trap-Destination Address

A management station (for example, Tivoli NetView Management Station) must be able to receive traps from the device to manage it.

To receive traps, you will need to manually add the management station's address to the device's list of trap destinations. Refer to Appendix A for help regarding setting the trap destination.

To identify whether or not the trap-destination address has been set, view the following log file for the machine running the management station. The log file will contain entries if the trap-destination address has NOT been set.

```
/usr/OV/log/hpStorageMgmt.log
```

Uninstalling the Tivoli NetView Enterprise Integration

Uninstalling on Solaris

- 1 Ensure that the NetView GUI is closed and all the NetView services are running. If any of the services are not running, use the following command to start them:

```
ovstart -c
```

- 2 On the Solaris machine on which the HP Storage Management enterprise integration for NetView is installed, enter the following command:

```
pkgrm HPStorage
```

When prompted to confirm the removal of the integration, enter 'y'.

- 3 When prompted to begin the uninstallation with super user permission, enter 'y'.
- 4 The uninstall process will begin. When the process is complete, the following message will be displayed:

```
Removal of <HPStorage> was successful
```

Uninstalling on AIX

- 1 Ensure that the NetView GUI is closed and all the NetView services are running. If any of the services are not running, use the following command to start them:

```
/usr/OV/bin/ovstart -c
```

- 2 On an AIX machine on which Integration for NetView is installed, enter the following command:

```
installp -u HPStorage
```

- 3 The uninstall process will begin. When the process is complete, the following message and Installation Summary will be displayed :

```
Successfully uninstalled <HPStorage>
```


SNMP Trap Destination

The HP StorageWorks Enterprise Integrations requires that you configure the SNMP trap destination on the HP StorageWorks Command View XP management station to the enterprise management station's host name or IP address.

To configure the SEMI-1 SNMP trap destinations on the Command View XP management server, refer to the instructions located on the Command View management server at

`<cv_xp_install_root>\hpss\subagent\readme.txt`.

Follow the directions for setting trap destinations for the SEMI-1/Enterprise Integrations subagent. Make sure to configure the destination for the Enterprise Integrations management platform, where SNMP traps are sent for XP arrays.

SNMP Trap Events

Trap Events

Please refer to the following files on the CV XP management server for definitions of events that CV XP is capable of reporting:

XP128 External Events

```
<cv_xp_install_root>\hpss\dm\tomcat\webapps\hpstmgmt\
webroot\Stormgmt\XP128RSimFile.txt
```

XP 512: External Events

```
<cv_xp_install_root>\hpss\dm\tomcat\webapps\hpstmgmt\
webroot\Stormgmt\XP512RSimFile.txt
```

XP48 External Events

```
<cv_xp_install_root>\hpss\dm\tomcat\webapps\hpstmgmt\
webroot\Stormgmt\XP48RSimFile.txt
```

XP256 External Events

```
<cv_xp_install_root>\hpss\dm\tomcat\webapps\hpstmgmt\
webroot\Stormgmt\XP256RSimFile.txt
```


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